**URS DIN 01567 Rev 2** 

## **Operations and Maintenance Cost Results**

## **Durham-Orange Light Rail Transit Project**



July 24, 2015

The NEPA Preferred Alternative for the D-O LRT Project would generally follow NC 54, I-40, US 15-501, and the North Carolina Railroad (NCRR) Corridor in downtown Durham and east Durham. The alignment would begin at UNC Hospitals, parallel Fordham Boulevard, proceed east on NC 54, travel north on I-40, parallel US 15-501 before it turns east toward the Duke University campus along Erwin Road, and then follow the NCRR Corridor parallel to NC 147 through downtown Durham, before reaching its eastern terminus near Alston Avenue. The alignment would consist of at-grade alignment, fill and cut sections, and elevated structures. In two sections of the alignment, Little Creek and New Hope Creek, multiple Light Rail Alternatives are evaluated in the DEIS.

This technical report contains information for all alternatives analyzed in the DEIS. However, pursuant to MAP 21, the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (P.L. 112-141), a NEPA Preferred Alternative has been developed, which recommends C2A in the Little Creek section of the alignment, NHC 2 in the New Hope Creek section of the alignment, the Trent/Flowers Drive station, and the Farrington Road Rail Operations and Maintenance Facility.



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## **List of Acronyms and Abbreviations**

Acronym/Abbreviation	Definition
AA	alternatives analysis
САМРО	Capital Area Metropolitan Planning Organization
CHT	Chapel Hill Transit
СРІ	consumer price index
CPI-U	consumer price index for all urban consumers
DATA	Durham Area Transit Authority
DBBS	Designing Better Bus Service
DCHC	Durham/Chapel Hill/Carrboro
DEIS	Draft Environmental Impact Statement
D-O	Durham-Orange
D-O LRT	Durham-Orange Light Rail Transit
DTCC	Durham Technical Community College
DUMC	Duke University Medical Center
FTA	Federal Transit Administration
I-40	Interstate 40
LPA	locally preferred alternative
LRT	light rail transit
MPO	metropolitan planning organization
MTP	metropolitan transportation plan
NC	North Carolina
NCCU	North Carolina Central University
NCRR	North Carolina Railroad
NHC	New Hope Creek
0&M	operations and maintenance
ROMF	rail operations and maintenance facility
UNC	University of North Carolina
US	United States
VA	Veteran Affairs



#### 1. Introduction

Triangle Transit, in cooperation with the Federal Transit Administration (FTA), has prepared a Draft Environmental Impact Statement (DEIS) to evaluate a potential high-capacity transit improvement in the Triangle region, within the Durham-Orange (D-O) Corridor, between Chapel Hill and Durham.

This report describes the bus and rail operations plans and the associated operating costs for the alternatives that have been defined for this project. The report begins with a brief description of existing transit services in the project study area, and how the existing services are modified to become the No-Build network. This No-Build network is the basis on which the other project alternatives have been defined.

This report also includes a description of the proposed supporting background bus service for the Light Rail Alternatives. The supporting background bus services are identical for all of the Light Rail Alternatives.

A list of data used in the model for the No-Build network and the Light Rail Alternatives is also included in this report. The report ends with tabular data describing the operations and costs of the No-Build and Light Rail Alternatives project alternatives.

#### 1.1 Description of Study Corridor

The D-O Corridor is located within the Triangle region. It extends roughly 17 miles from southwest Chapel Hill to east Durham, and includes several educational, medical, and other key activity centers which generate a large number of trips each day. The land uses in the D-O Corridor are supported by a network of major highways including NC 54, I-40, US 15-501, Erwin Road, and NC 147. Additional detail regarding the study corridor is included in the *Durham-Orange Light Rail Transit Project DEIS*, chapters 1 and 2.

#### 1.2 Alternatives Considered

- No-Build Alternative
- Light Rail Alternatives

In addition to the Light Rail Alternatives, the DEIS considers a No-Build Alternative comprised of the existing and programmed transportation network improvements without the planned rail improvements and associated bus network modifications. Additional detail regarding the alternatives considered is included in the *Durham-Orange Light Rail Transit Project DEIS*, chapter 2.

#### 1.2.1 No-Build Alternative

The No-Build Alternative includes the existing and planned transportation programs and projects scheduled to be built and implemented before forecast year 2040 and contained in the 2040 Metropolitan Transportation Plan (MTP), excluding only the proposed Light Rail Alternatives, rail transit improvements and related bus transit modifications that would be associated with the proposed D-O LRT Project.



#### 1.2.2 Light Rail Alternatives

Through the Alternatives Analysis and Scoping process, a majority of the proposed D-O LRT Project alignment was identified. However, there are a few areas where different alternatives were retained for further evaluation. As a result, multiple alignments crossing Little Creek and New Hope Creek are evaluated in the DEIS.

- Four potential crossings of Little Creek between Hamilton Road and the proposed Leigh Village Station (Alternatives C1, C1A, C2, and C2A)
- Three potential crossings of New Hope Creek and Sandy Creek between Patterson Place and South Square (Alternatives NHC LPA, NHC 1, and NHC 2)
- Station alternatives at Duke/VA Medical Centers (i.e., Duke Eye Center and Trent/Flowers Drive)
- Five proposed locations for the ROMF (i.e., Leigh Village ROMF, Farrington Road ROMF, Patterson Place ROMF, Cornwallis Road ROMF, and Alston Avenue ROMF)

The Light Rail Alternatives would generally follow North Carolina (NC) Highway 54 (NC 54), Interstate 40 (I-40), United States (US) 15-501, and the North Carolina Railroad (NCRR) Corridor in downtown Durham and east Durham. The alignment would begin in Chapel Hill at UNC Hospitals, parallel Fordham Boulevard, proceed eastward adjacent to NC 54, travel north along I-40, parallel US 15-501 before it would turn east toward Duke University and run within Erwin Road, and then follow the NCRR Corridor that parallels NC Highway 147 (NC 147) through downtown Durham, before reaching its eastern terminus in Durham near Alston Avenue. The alignment would consist of at-grade alignment, fill and cut sections, and elevated structures. A total of 17 stations are planned, and up to 5,100 parking spaces would be provided along the Light Rail Alternatives. In addition, a rail operations and maintenance facility (ROMF) would be constructed to accommodate the D-O LRT fleet (initially 17 vehicles, with the ability to accommodate up to 26 vehicles without needing expansion).

Bus routes would be modified to feed into the D-O LRT stations, and headways would be adjusted to provide more frequent bus service and minimize transfer waiting times. These services would also connect light rail passengers with other area transportation hubs, including park-and-ride lots and transfer centers.

#### 1.3 Purpose of This Report

This report presents estimated annual operations and maintenance (O&M) costs for the proposed D-O LRT Project alternatives. This report follows the project's *Operations and Maintenance Cost Methodology Report* which presents a detailed description of the process used to develop the cost models.

As noted by the Federal Transit Administration (FTA) in *Procedures and Technical Methods for Transit Project Planning (Draft)*, dated November 2006, estimating O&M costs is an important part of planning New Starts projects for three reasons:

- Cost-effectiveness measures: The projection of annual O&M costs is a critical input to the determination of the New Starts measures of cost effectiveness.
- Environmental benefits measure: The projection of annual O&M costs is a critical input to the determination of the New Starts measures of environmental benefits.



• Financial planning: Annual O&M cost projections are vital to the development of financial plans that cover multiple years of construction and operation of New Starts projects.

The FTA requires the use of a resource-driven, fully-allocated cost model for O&M projections in a New Starts project. Resource-driven models connect specific expenses to specific service or system characteristics. Once expense items are assigned their driving variable(s), resource-driven models produce cost estimates accordingly. For example, after mathematically connecting bus operator wages/salaries to annual revenue bus-hours, a model would estimate the future annual cost of this expense item based on a study alternative's revenue bus-hours of service.

Transit operations affected by the D-O LRT Project alternatives include Triangle Transit, Durham Area Transit Authority (DATA) and Chapel Hill Transit (CHT).

This report continues with a brief description of the project alternatives in section 2 and a summary of the methodology used to estimate O&M costs in section 3. Section 4 of this report presents annual O&M cost estimates for the project alternatives.



#### 2. Project Alternatives

The D-O LRT Light Rail Alternatives for the current phase of the project is being compared to a No-Build Alternative. Full descriptions of the service plans for each alternative are provided in the project's *Transit Operating Plan* dated April 2015. Brief highlights of the operating plan assumptions for each alternative are provided below.

#### 2.1 No-Build Alternative

A No-Build Alternative establishes a reference point for the environmental impacts of the alternatives and the financial condition of the transit operator(s).

For the D-O LRT Project, the definition of the No-Build Alternative began with incorporating planned improvements from the region's long-range plan. The 2040 Metropolitan Transportation Plan (MTP) was adopted by the Durham-Chapel Hill-Carrboro (DCHC) Metropolitan Planning Organization (MPO) and Capital Area Metropolitan Planning Organization (CAMPO). The MTP assumes significant expansion of the region's transit network with revenues from the planned sales tax referendum and vehicle registration fees; the MTP also includes the D-O LRT Project in its transit network. The following modifications were made to the MTP transit network to define the appropriate No-Build Alternative in the context of a New Starts project:

- The D-O LRT line was removed from the 2040 MTP network.
- Triangle Transit Routes 400A and 400B were included in the No-Build network. These proposed routes are similar to the existing Routes 400 and 405 that presently operate in the D-O LRT Corridor (from downtown Durham to downtown Chapel Hill). They were not included in the 2040 MTP network because LRT was assumed in this corridor.
- Existing Triangle Transit Routes 700 and the DRX were added back into the No-Build network.
   Both routes were excluded from the 2040 MTP network because the network assumed commuter rail in this corridor.
- Triangle Transit recently began operating a short-turn pattern for Route 800. The new pattern was added to the 2040 network.
- After consultation with Triangle Transit and CHT service planning staff, several more Triangle
  Transit routes were eliminated from the 2040 MTP network including the Butner-Durham
  Express, the New Hope-RTP Express and Triangle Transit Circulators; Research Triangle,
  Southport, and Purple.
- The Bull City Connector was added into the No-Build Alternative. This is an existing local route that operates in Durham and was not included in the 2040 MTP network because it operates parallel to the MTP's D-O LRT line.
- The 2040 MTP network assumed several new feeder routes associated with the D-O LRT line. Since this No-Build network does not include this LRT line, these feeder routes were removed.
- Service improvements identified in Scenario 3 of DATA's Designing Better Bus Service (DBBS) study were also assumed in the 2040 No-Build network. This plan was developed by DATA in May of 2012 with service recommendations based across four fronts: Safety, Service Quality,



Fiscal Responsibility, and Community Benefits. DATA has already implemented many of the service improvements identified in Scenarios 1 and 2 of the DBBS project.

#### 2.2 Light Rail Alternatives

The Light Rail Alternatives consist of LRT service from UNC Hospitals in Chapel Hill to Alston Avenue in Durham. Summarizing the alignment, it begins near the Dogwood Parking Deck on the southern side of the UNC campus and proceeds to Friday Center, Leigh Village, South Square, Duke Medical Center, Durham Station, and terminates just west of Alston Avenue along Pettigrew Street on the south side of the railroad tracks. The proposed LRT alignment includes 17 stations and eight of the sites include parkand-ride facilities.

Operating hours for the new LRT service are proposed to be from 5:30 a.m. to midnight on weekdays and Saturdays, and 6:30 a.m. to midnight on Sundays. Proposed service frequencies on weekdays would be 10 minutes during peak periods, 20 minutes during the midday and 30 minutes in the evening. Saturday service would operate every 20 minutes until 7:00 p.m., when the frequency would be reduced to every half hour. Sunday service would operate at 30-minute intervals before 9:00 a.m. and after 7:00 p.m., with 20-minute service during the day.

It was determined that a mix of one and two-car trains would be sufficient to accommodate projected ridership and remain below a 2.0 load factor (i.e., one standing passenger for every seated passenger in the a.m. peak hour).

#### 2.3 Supporting Background Bus Service for Light Rail Alternatives

With the introduction of new premium bus or LRT service in the D-O LRT Corridor, several changes would be made to existing Triangle Transit, DATA, and CHT routes in the corridor. These changes can be categorized as the following:

- Elimination of duplicative bus service: Two Triangle Transit routes (Routes 400A, 400B), four CHT routes (Routes DX, FCX, HU, and S) and one DATA route (Bull City Connector) are eliminated from the transit network.
- Changes to the background bus network: Several DATA, CHT, and Triangle Transit route alignments are modified to include connections to nearby stations.
- Introduction of new feeder bus routes: New feeder routes are proposed along the alignment to improve connectivity to the LRT service.

As noted at the beginning of this section, the project's *Transit Operating Plan* documents proposed changes to the local bus networks.



#### 3. Operations and Maintenance Cost Models

Per FTA guidance, detailed descriptions of the project's O&M spreadsheet cost models were provided separately in the *Operations and Maintenance Cost Methodology Report*. In that report, it was noted that resource build-up spreadsheet cost models were developed for the D-O LRT Project based on 2012 actual expenditures for Triangle Transit, DATA, and CHT and also for the LRT systems selected as peers for the Light Rail Alternatives of this project.

Input variables determine all costs for each service provider. The D-O LRT O&M cost models require the following bus and light rail input:

#### Triangle Transit Bus Input Variables

- Annual revenue Triangle Transit bus-hours
- Annual revenue contractor bus-hours
- Annual revenue Triangle Transit bus-miles
- Annual revenue contractor bus-miles
- Number of bus garages
- Number of regional transit centers
- Number of peak buses

#### **DATA Bus Input Variables**

- Annual revenue bus-hours
- Annual revenue bus-miles
- Number of bus garages
- Number of regional transit centers
- Number of peak buses

#### **CHT Bus Input Variables**

- Annual revenue bus-hours
- Annual revenue bus-miles
- Number of bus garages
- Number of peak buses

#### **LRT Input Variables**

- Annual revenue train-hours
- Annual revenue car-miles
- Number of yards
- Directional route miles
- Number of passenger stations
- Number of peak cars

The cost model spreadsheets also incorporate a factor to allow costs to be inflated or deflated as necessary.



#### 4. Operations and Maintenance Cost Estimates

This section identifies annual O&M cost estimates for the D-O LRT Project alternatives. Annual O&M costs have been developed for the No-Build and Light Rail Alternatives using the cost models referenced briefly in section 3 of this report and fully described in this project's *Operations and Maintenance Cost Methodology Report*. O&M costs depicted in this section are based on actual 2012 expenses for bus and light rail, inflated to 2015 dollars using the consumer price index (CPI) of the U.S. Department of Labor, Bureau of Labor Statistics, as follows:

- Local bus costs were inflated with the consumer price index for all urban consumers (CPI-U) for the south region, using data for the two most recent annual periods (2012 to 2013, and 2013 to 2014) and then applying the average annual rate for this two-year period as a proxy for an additional 12 months of inflation so that project O&M cost estimates will represent 2015 dollars.
- Light rail costs were inflated with the CPI-U for the U.S. city average, using data for 2012 to 2013, and then from 2013 to 2014. As was done for the existing local transit providers, the average annual rate for this two-year period was used as a proxy for an additional full year of inflation so that project LRT O&M cost estimates will represent 2015 dollars.

Key supply variables (model input) for the No-Build and Light Rail Alternatives are based on the project's operating plans and O&M cost model methodology referenced above. The LRT service plan assumes 11 trains in peak period operation, with three trains operating as 2-car trains and the other eight trains operating as single-car trains. All model inputs for the study alternatives reflect the incremental change in service for the D-O LRT portion of regional transit, rather than system-wide service. Table 4.1 shows the alternatives' incremental statistics and costs over existing transit in the corridor.

- The No-Build Alternative, with its service improvements, is anticipated to add \$8.1 million to the annual O&M cost of existing service in the study corridor.
- Light Rail Alternatives will add between \$16.2 (Alternative C1-NHC LPA) and \$16.38 (Alternative C1A-NHC 1) million to the annual O&M cost of transit over the No-Build.

Because the study corridor affects multiple transit operations, Table 4.1 summarizes the incremental change in operating statistics and O&M costs by transit agency and alternative.

The appendices include printouts of the model runs for each of the transit operators, to show the incremental cost (over existing) for each project alternative, by operator.



Table 4-1: Summary of Incremental Operating Statistics and O&M Costs

	Mar In	K. O and Madella	Hart San	No-Build	04 1110 1 04	04 4 4 1110 1 104	00 1110 1 04	C2A-NHC LPA	C1-NHC 1	C1A-NHC 1	C2-NHC 1	C2A-NHC 1	C1-NHC 2	C1A-NHC 2	C2-NHC 2	004 1110 0
Operator	Mode	Key Supply Variable	Unit Cost	No-Build	C1-NHC LPA	C1A-NHC LPA	C2-NHC LPA	C2A-NHC LPA	C1-NHC 1	C1A-NHC 1	C2-NHC 1	C2A-NHC 1	C1-NHC 2	C1A-NHC 2	C2-NHC 2	C2A-NHC 2
Triangle	Bus	Ann. Rev. TT Bus-Hours	\$51.53	23,545	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695	-6,695
Transit		Ann. Rev. Contr'd. Bus-Hours	\$67.48	0	0	0	0	0	0	0	0	0	0	0	0	0
		Ann. Rev. TT Bus-Miles	\$1.83	416,769	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334	-30,334
		Ann. Rev. Contr'd. Bus-Miles	\$0.99	0	0	0	0	0	0	0	0	0	0	0	0	0
		Maintenance Garages	\$426,354	0	0	0	0	0	0	0	0	0	0	0	0	0
		Regional Transit Centers	\$132,487	0	0	0	0	0	0	0	0	0	0	0	0	0
		Peak Buses	\$52,050	11	1	1	1	1	1	1	1	1	1	1	1	1
		Total Cost		\$2,548,500	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400	-\$348,400
	LRT	Ann. Rev. Train-Hours	\$91.51	0	48,300	48.300	48,300	48.300	48.300	48.300	48.300	48.300	48.300	48.300	48.300	48.300
		Ann. Rev. Car-Miles	\$3.12	0	937.700	952.300	947.800	946.100	955,100	969,600	965.100	963,500	951,200	965,100	960,600	959.100
		Yards	\$1,155,486	0	1	1	1	1	1	1	1	1	1	1	1	1
		Directional Route-Miles	\$71.745	0	33.52	34.04	33.88	33.82	34.14	34.66	34.50	34.44	34.00	34.50	34.34	34.28
		Stations	\$150,873	0	17	17	17	17	17	17	17	17	17	17	17	17
		Peak LRVs	\$310,743	0	14	14	14	14	14	14	14	14	14	14	14	14
		Total Cost		\$0	\$17,822,900	\$17,905,800	\$17,880,200	\$17,870,600	\$17,921,700	\$18,004,200	\$17,978,700	\$17,969,400	\$17,899,500	\$17,978,700	\$17,953,200	\$17,944,200
	Total Tri	angle Transit Cost		\$2,548,500	\$17,474,500	\$17,557,400	\$17,531,800	\$17,522,200	\$17,573,300	\$17,655,800	\$17,630,300	\$17,621,000	\$17,551,100	\$17,630,300	\$17,604,800	\$17,595,800
DATA	Bus	Ann. Rev. Bus-Hours	\$43.15	36.889	61.135	61.135	61.135	61.135	61.135	61.135	61.135	61.135	61.135	61.135	61.135	61.135
DATA	Dus	Ann. Rev. Bus-Hours	\$1.72	462,378	759,152	759.152	759.152	759.152	759.152	759.152	759.152	759.152	759.152	759.152	759.152	759,152
		Maintenance Garages	\$818,227	0	0	739,132	0	0	0	739,132	739,132	739,132	739,132	739,132	739,132	739,132
		Regional Transit Centers	\$70,468	0	0	0	0	0	0	0	0	0	0	0	0	0
		Peak Buses	\$104.869	7	11	11	11	11	11	11	11	11	11	11	11	11
		Total Cost	\$104,009	\$3,122,200	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100	\$5,099,100
CHT	Bus	Ann. Rev. Bus-Hours	\$49.71	27,731	22,233	22,233	22,233	22,233	22,233	22,233	22,233	22,233	22,233	22,233	22,233	22,233
		Ann. Rev. Bus-Miles	\$2.49	359,061	258,974	258,974	258,974	258,974	258,974	258,974	258,974	258,974	258,974	258,974	258,974	258,974
		Maintenance Garages	\$1,307,492	0	0	0	0	0	0	0	0	0	0	0	0	0
		Regional Transit Centers	\$0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Peak Buses	\$22,416	. 7	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
		Total Cost		\$2,428,900	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200	\$1,727,200
TOTAL ADD	DITIONAL	Alternative		\$8,099,600	\$24,300,800	\$24,383,700	\$24,358,100	\$24,348,500	\$24,399,600	\$24,482,100	\$24,456,600	\$24,447,300	\$24,377,400	\$24,456,600	\$24,431,100	\$24,422,100

Notes: Costs are in 2015 dollars

Costs shown for the above alternatives are applicable for both the Duke Eye Center and Trent/Flowers Drive Station alternatives.



## **Appendices**



# APPENDIX A – Triangle Transit Incremental Cost (Over Existing) of Each Alternative Including LRT Service



#### Appendix A Table 1

Durham-Orange County Corridor
Triangle Regional Transit Program
O&M Cost Models
TRIANGLE TRANSIT AUTHORITY BUS LINE ITEM DETAIL

No-Build

															Inflat	ion Factor:	1.049
	2012	Existing	New			lus Supply Var		t Rate (\$2012				uctivity Ratio		Base Year		Results in:	
	Bus	Unit Cost	Unit Cost			TTA Revenue			Regional		Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Expenses	Adjusted	Added	Bus-Hours	Bus-Hours	Bus-Miles	Bus-Miles	Garages	Transit Ctrs	Peak Buses	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cost
VEHICLE OPERATIONS											1						
OPERATORS' SALARIES & WAGES	\$3,246,438			\$33.28							Work Hours	147,985	1.517	\$21.94	1.049	\$23.02	\$822,016
OTHER SALARIES & WAGES - Rev-Hours Driven (70%)	\$346,191			\$3.55							Work Hours	9,007	0.092	\$38.44	1.049	\$40.32	\$87,658
OTHER SALARIES & WAGES - Garage Driven (30%)	\$148,368							\$148,368			Work Hours	3,860	3,860	\$38.44	1.049	\$40.32	\$0
FRINGE BENEFITS - Rev-Hours Driven	\$1,198,909			\$12.29							Work Hours	156,992	1.609	\$7.64	1.049	\$8.01	\$303,570
FRINGE BENEFITS - Garage Driven	\$49,512							\$49,512			Work Hours	3,860	3,860	\$12.83	1.049	\$13	\$0
PROFESSIONAL & TECH SVCS - Peak Buses Driven	\$90,395									\$1,532	Peak Buses	59	1.000	\$1,532	1.049	\$1,607	\$17,681
PROFESSIONAL & TECH SVCS - Contract-Hours Driven	\$654,983				\$64.32						Contracted Hours	10,183	1.000	\$64.32	1.049	\$67.48	\$0
FUEL & LUBRICANTS	\$1,679,008					\$0.85					Gallons	525,241	0.266	\$3.20	1.049	\$3.35	\$371,103
TIRES & TUBES	\$99,712					\$0.05					Revenue Miles	1,978,235	1.000	\$0.05	1.049	\$0.05	\$22,039
OTHER MATERIALS & SUPPLIES	\$7,760							\$7,760			Garages	1	1.000	\$7,760	1.049	\$8,141	\$0
MISCELLANEOUS EXPENSES	\$55,794							\$55,794			Garages	1	1.000	\$55,794	1.049	\$58,534	\$0
VEHICLE MAINTENANCE	•																
SALARIES & WAGES - Mechanics	\$775,992					\$0.39					Work Hours	28,548	0.014	\$27.18	1.049	\$28.52	\$171,514
FRINGE BENEFITS	\$258,189					\$0.13					Work Hours	28,548	0.014	\$9.04	1.049	\$9.49	\$57,066
PROFESSIONAL & TECH SVCS - TTA Rev-Miles Driven	\$120,566					\$0.06					Revenue Miles	1,978,235	1.000	\$0.06	1.049	\$0.06	\$26,648
PROFESSIONAL & TECH SVCS - Contract-Miles Driven	\$215,573						\$0.94				Contracted Miles	228,833	22.472	\$0.00	1.049	\$0.00	\$0
FUEL & LUBRICANTS	\$0									\$0.00	Peak Buses	59	1.000	\$0.00	1.049	\$0	\$0
TIRES & TUBES	\$3,084									\$52.27	Peak Buses	59	1.000	\$52.27	1.049	\$54.84	\$603
OTHER MATERIALS & SUPPLIES	\$481,098					\$0.24					Revenue Miles	1,978,235	1.000	\$0.24	1.049	\$0.26	\$106,335
CASUALTY & LIABILITY	\$36,036					\$0.02					Revenue Miles	1,978,235	1.000	\$0.02	1.049	\$0.02	\$7,965
MISCELLANEOUS EXPENSES	\$30,928							\$30,928			Garages	1	1.000	\$30,928	1.049	\$32,447	\$0
NON-VEHICLE MAINTENANCE		1															
SALARIES & WAGES	\$0							\$0			Garages	1	1.000	\$0.00	1.049	\$0.00	\$0
FRINGE BENEFITS	\$0							\$0			Garages	1	1.000	\$0.00	1.049	\$0.00	\$0
PROFESSIONAL & TECH SERVICES	\$126,284								\$126,284		Transit Centers	1	1.000	\$126,284	1.049	\$132,487	\$0
GENERAL ADMINISTRATION										•							
SALARIES & WAGES	\$1,278,335									\$21,667	Work Hours	30.553	517.8	\$41.84	1.049	\$43.89	\$250,040
FRINGE BENEFITS	\$423,262									\$7,174	Work Hours	30,553	517.8	\$13.85	1.049	\$14.53	\$82,789
PROFESSIONAL & TECHNICAL SERVICES	\$256,950									\$4,355	Peak Buses	59	1.000	\$4.355			\$50,259
MATERIALS & SUPPLIES	\$34,556							\$34,556		ψ 1,000	Garages	1	1.000	\$34,556		. ,	\$0
UTILITIES	\$79,475							\$79,475			Garages	1	1.000	\$79,475		****	\$0
CASUALTY & LIABILITY	\$733.957	1						ψ13,413		\$12,440	Peak Buses	59	1.000	\$12,440		,	\$143.561
MISCELLANEOUS EXPENSES	\$141,215	1								\$2,393	Peak Buses	59	1.000	\$2,393		,	\$27,621
TOTALS	\$12,572,570			\$49.12	\$64.32	\$1.74	\$0.94	\$406,393	\$126,284	\$49,614	1 Cak Buscs	33	1.000	Ψ2,030	1.043	\$2,511	\$2,548,467
2012 Resource Variable Values	Ç.2,072,070			97.555	10.183	1.978.235	228.833	1	1	59						TT Rev Hours	23.545
Notes:	·			37,000	10,100	.,510,200	220,000		<u> </u>		ı					Contract Hours	0
NTD Fringe Benefit Rate for Vehicle Ops =	33.4%															TT Rev Miles	416,769
NTD Fringe Benefit Rate for Vehicle Maint =	33.1%															Contract Miles	0
NTD Fringe Benefit Rate for General Admin =	33.1%															Garages	0
																Transit Centers	0
															1.049 \$58,534  1.049 \$28.52 1.049 \$9.49 1.049 \$0.06 1.049 \$0.00 1.049 \$0.26 1.049 \$0.02 1.049 \$0.02 1.049 \$0.02 1.049 \$0.02 1.049 \$0.00 1.049 \$32,447  1.049 \$0.00 1.049 \$132,487  1.049 \$43.89 1.049 \$45.69 1.049 \$36,253 1.049 \$36,253 1.049 \$313,051 1.049 \$2,511  TT Rev Hours Contract Hiers Garages Garages Garages		11



#### **Appendix A Table 2**

Durham-Orange County Corridor
Triangle Regional Transit Program
O&M Cost Models
TRIANGLE TRANSIT AUTHORITY BUS LINE ITEM DETAIL

Build

															Inflat	ion Factor:	1.049
	2012	Existing	New			Bus Supply Var		t Rate (\$2012				luctivity Ratio		Base Year		Results in:	2015\$
Expense Line Item	Bus Expenses	Unit Cost Adjusted	Unit Cost Added	TTA Revenue Bus-Hours	Bus-Hours	TTA Revenue Bus-Miles	Contracted Bus-Miles	Garages	Regional	Peak Buses	Resource Variable	Resource Value	Resource/ Supply	Resource Unit Cost	Inflation Factor	Resource Unit Cost	Estimated Annual Cos
VEHICLE OPERATIONS	Lxperises	Aujusteu	Audeu	Bus-Hours	Dus-Hours	Dus-Willes	Dus-willes	Garages	Transit Cus	reak Duses	Variable	Value	Supply	Offic Cost	ractor	Onit Cost	Allitual Cos
OPERATORS' SALARIES & WAGES	\$3,246,438	Т		\$33.28						1	Work Hours	147.985	1,517	\$21.94	1.049	\$23.02	(\$233,740)
OTHER SALARIES & WAGES - Rev-Hours Driven (70%)	\$346,191			\$3.55							Work Hours	9,007	0.092	\$38.44	1.049	\$40.32	(\$24,925)
OTHER SALARIES & WAGES - Garage Driven (30%)	\$148,368			ψ0.00				\$148,368			Work Hours	3,860	3,860	\$38.44	1.049	\$40.32	\$0
FRINGE BENEFITS - Rev-Hours Driven	\$1,198,909			\$12.29				ψ140,000			Work Hours	156,992	1,609	\$7.64	1.049	\$8.01	(\$86.320)
FRINGE BENEFITS - Garage Driven	\$49.512			ψ12.20				\$49,512			Work Hours	3.860	3,860	\$12.83	1.049	\$13	\$0
PROFESSIONAL & TECH SVCS - Peak Buses Driven	\$90,395							Q 10,012	1	\$1.532	Peak Buses	59	1.000	\$1.532	1.049	\$1.607	\$1,607
PROFESSIONAL & TECH SVCS - Contract-Hours Driven	\$654,983				\$64.32					ψ1,00 <u>2</u>	Contracted Hours	10,183	1.000	\$64.32	1.049	\$67.48	\$0
FUEL & LUBRICANTS	\$1,679,008				ψ01.02	\$0.85			1		Gallons	525,241	0.266	\$3.20	1.049	\$3.35	(\$27,010)
TIRES & TUBES	\$99.712					\$0.05					Revenue Miles	1,978,235	1.000	\$0.05	1.049	\$0.05	(\$1,604)
OTHER MATERIALS & SUPPLIES	\$7,760					ψο.σσ		\$7.760	1		Garages	1	1.000	\$7,760	1.049	\$8,141	\$0
MISCELLANEOUS EXPENSES	\$55.794	<u> </u>						\$55,794			Garages	1	1.000	\$55,794	1.049	\$58,534	\$0
VEHICLE MAINTENANCE	\$00,707							<b>400,70</b> 1			Guragoo	<u> </u>	1.000	400,701	1.010	400,001	- 40
SALARIES & WAGES - Mechanics	\$775.992	Т				\$0.39					Work Hours	28,548	0.014	\$27.18	1.049	\$28.52	(\$12.483)
FRINGE BENEFITS	\$258,189					\$0.13					Work Hours	28,548	0.014	\$9.04	1.049	\$9.49	(\$4,153)
PROFESSIONAL & TECH SVCS - TTA Rev-Miles Driven	\$120,566	<u> </u>				\$0.06					Revenue Miles	1.978.235	1.000	\$0.06	1.049	\$0.06	(\$1,940)
PROFESSIONAL & TECH SVCS - Contract-Miles Driven	\$215.573					ψο.σσ	\$0.94				Contracted Miles	228.833	22,472	\$0.00	1.049	\$0.00	\$0
FUEL & LUBRICANTS	\$0						ψο.ο :		1	\$0.00	Peak Buses	59	1.000	\$0.00	1.049	\$0	\$0
TIRES & TUBES	\$3.084									\$52.27	Peak Buses	59	1.000	\$52.27	1.049	\$54.84	\$55
OTHER MATERIALS & SUPPLIES	\$481,098					\$0.24				QOZ.Z.	Revenue Miles	1.978.235	1.000	\$0.24	1.049	\$0.26	(\$7,739)
CASUALTY & LIABILITY	\$36,036					\$0.02					Revenue Miles	1,978,235	1.000	\$0.02	1.049	\$0.02	(\$580)
MISCELLANEOUS EXPENSES	\$30,928					ψ0.02		\$30,928			Garages	1	1.000	\$30,928	1.049	\$32,447	\$0
NON-VEHICLE MAINTENANCE	, , , , , , , , , , , , , , , , , , ,	1						****				<u> </u>		*******		<b>4</b> -2,111	
SALARIES & WAGES	\$0							\$0			Garages	1	1.000	\$0.00	1.049	\$0.00	\$0
FRINGE BENEFITS	\$0							\$0			Garages	1	1.000	\$0.00	1.049	\$0.00	\$0
PROFESSIONAL & TECH SERVICES	\$126,284								\$126,284		Transit Centers	1	1.000	\$126,284	1.049	\$132.487	\$0
GENERAL ADMINISTRATION																	
SALARIES & WAGES	\$1,278,335									\$21,667	Work Hours	30,553	517.8	\$41.84	1.049	\$43.89	\$22,731
FRINGE BENEFITS	\$423,262									\$7,174	Work Hours	30,553	517.8	\$13.85	1.049	\$14.53	\$7,526
PROFESSIONAL & TECHNICAL SERVICES	\$256,950									\$4,355	Peak Buses	59	1.000	\$4,355	1.049	\$4,569	\$4,569
MATERIALS & SUPPLIES	\$34,556							\$34,556			Garages	1	1.000	\$34,556	1.049	\$36,253	\$0
UTILITIES	\$79,475							\$79,475			Garages	1	1.000	\$79,475	1.049	\$83,379	\$0
CASUALTY & LIABILITY	\$733,957									\$12,440	Peak Buses	59	1.000	\$12,440	1.049	\$13,051	\$13,051
MISCELLANEOUS EXPENSES	\$141,215									\$2,393	Peak Buses	59	1.000	\$2,393	1.049	\$2,511	\$2,511
TOTALS	\$12,572,570			\$49.12	\$64.32	\$1.74	\$0.94	\$406,393	\$126,284	\$49,614							(\$348,444)
2012 Resource Variable Values				97,555	10,183	1,978,235	228,833	1	1	59						TT Rev Hours	(6,695)
Notes:	*	•				•			•							Contract Hours	0
NTD Fringe Benefit Rate for Vehicle Ops =	33.4%															TT Rev Miles	(30,334)
NTD Fringe Benefit Rate for Vehicle Maint =     NTD Fringe Benefit Rate for General Admin =	33.1% 33.1%															Contract Miles Garages	0
3. NTD Tringe benefit Nate for General Admin =	33.1%															Transit Centers	0
																Peak Buses	1



C1-NHC LPA

#### **Appendix A Table 3**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

General Administration = 33.11%

											Inflatio	on Factor:	1.047
		Light Rail	Supply Variab	le Unit Cost R	ate (2012\$)		Pro	oductivity Ratio	)	Base Year		Results in:	2015\$
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimate
xpense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Co
EHICLE OPERATIONS												207.17	
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,32
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,21
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,26
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,04
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$364,51
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,96
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
EHICLE MAINTENANCE													
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,327,47
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$439,53
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$302,01
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34					Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$331,90
VM Other Matl & Supplies (Peak Cars)						\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,14
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
ON-VEHICLE MAINTENANCE				•				•					
NVM Salaries & Wages (Route-Mi)				\$36,531			Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,281,64
NVM Salaries & Wages (Stations)					\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,16
NVM Salaries & Wages (Yards)			\$406,114		ψ10,201		Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,06
Fringe Benefits (Route-Mi Driven)			4.00,	\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$424,35
NVM Fringe Benefits (Stations Driven)				ψ12,000	\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,59
NVM Fringe Benefits (Yard Driven)			\$134,466		ψ14,303		Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,74
NVM Prof/Tech Services (Route-Mi)	-		φ134,400	\$12,152			Route-Mi	37	1.000	\$12.152	1.047	\$12,719	\$426,35
NVM Prof/Tech Services (Route-Wil)				φ12,132	\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,09
NVM Prof/Tech Services (Yards)			\$150,340		\$10,576	1	Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,35
NVM Matl & Supplies (Route-Mi)			\$150,340	\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$261,07
				\$7,441	60.000			22			1.047		
NVM Matl & Supplies (Stations)			\$82,257		\$8,928		Stations		1.000	\$8,928	1.047	\$9,345	\$158,86
NVM Matl & Supplies (Yards)			\$82,257	2000			Yards	1		\$82,257		\$86,095	\$86,095
NVM Miscellaneous			ļ	\$327	ļ		Route-Mi	37	1.000	\$327	1.047	\$342	\$11,461
SENERAL ADMINISTRATION												200.00	21 222 -
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,73
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,36
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,39
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174	-	Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,38
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,23
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,70
		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$161,65
GA Casualty & Liability (Car-Mi)					1	\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Casualty & Liability (Car-Mi) GA Taxes & Fees													
GA Casualty & Liability (Car-Mi) GA Taxes & Fees GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,15
GA Casualty & Liability (Car-Mi) GA Taxes & Fees	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$15,025 <b>\$296,889</b>	Peak Cars	33	1.000				\$220,15 <b>\$17,822,8</b>
GA Casualty & Liability (Car-Mi) GA Taxes & Fees GA Miscellaneous	\$87.43 87,461	\$2.98 2,572,416	\$1,103,974 1.4	\$68,546 37.3	\$144,147 22		Peak Cars	33	1.000				
GA Casualty & Liability (Car-Mi) GA Taxes & Fees GA Miscellaneous OTALS	87,461					\$296,889	Peak Cars	33	1.000			\$15,726	\$17,822,8 48,300 937,700
GA Casualty & Liability (Car-Mi) GA Taxes & Fees GA Miscellaneous  TALS  172 Resource Variable Values iangle Transit agency fringe benefit rates use Vehicle Operations =	87,461 ed: 33.37%					\$296,889	Peak Cars	33	1.000			\$15,726  Rev Train-Hrs  Rev Car-Miles  Peak Cars	\$17,822,8 48,300 937,700 14
GA Casualty & Liability (Car-Mi) GA Taxes & Fees GA Miscellaneous DTALS 112 Resource Variable Values inangle Transit agency fringe benefit rates use	87,461 ed: 33.37% 33.11%					\$296,889	Peak Cars	33	1.000			\$15,726 Rev Train-Hrs Rev Car-Miles	\$17,822,8 48,300 937,700



#### **Appendix A Table 4**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

	HC.	

											Inflati	on Factor:	1.047
			Supply Variab	le Unit Cost R	ate (2012\$)			oductivity Ratio		Base Year		Results in:	2015\$
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation		Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cos
VEHICLE OPERATIONS			1										
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$370,195
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE													
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,348,147
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$446,377
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$306,721
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34				<u> </u>	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$337,073
VM Other Matl & Supplies (Peak Cars)		•				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE						,				,		,	+,
NVM Salaries & Wages (Route-Mi)				\$36,531			Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,301,524
NVM Salaries & Wages (Stations)				400,000	\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Stations)			\$406,114		ψ+3,231		Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)			ψ+00,114	\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$430,940
NVM Fringe Benefits (Stations Driven)				ψ12,033	\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Stations Driven)			\$134,466		\$14,503		Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)			\$134,400	\$12,152		1	Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$432,965
NVM Prof/Tech Services (Rodie-Wil)				\$12,132	\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Stations)			\$150,340		\$10,576	1	Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)	+		\$150,340	\$7,441		<b>.</b>		37	1.000	\$7,441	1.047	\$7,789	\$265,122
	+		1	\$7,441	#0.000	<b>.</b>	Route-Mi	22					
NVM Matl & Supplies (Stations)					\$8,928		Stations		1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257				Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous				\$327	l		Route-Mi	37	1.000	\$327	1.047	\$342	\$11,639
GENERAL ADMINISTRATION			1										
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits			ļ			\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services			ļ			\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$164,175
GA Taxes & Fees			1			\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,905,764
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33	l					Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us												Rev Car-Miles	952,300
Vehicle Operations :												Peak Cars	14
Vehicle Maintenance :												Track Miles	34.0
Non-Vehicle Maintenance												Stations	17
General Administration :	= 33.11%											Yards	1.0



C2-NHC LPA

#### **Appendix A Table 5**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

											Inflatio	on Factor:	1.047
		Light Rail	Supply Variab	le Unit Cost Ra	ate (2012\$)		Pro	ductivity Ratio		Base Year	atr	Results in:	2015\$
	Revenue	Revenue	Tappiy variab	Revenue	(20124)		Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cost
VEHICLE OPERATIONS			,										
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16					,	Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30.591	\$520.049
VO Other Matl & Supplies	\$0.67				,		Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$368,446
VO Utilities (Peak Cars)		40.0.				\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06					4=-,	Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE								,		******			
VM Salaries & Wages	1	\$1.35				T .	Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,341,776
VM Fringe Benefits		\$0.448				İ	Car-Miles	Work Hours	0.053	\$8,47	1.047	\$8.86	\$444.268
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$305,272
VM Fuel & Lubricants		ψο.σ ι				\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34				<b>*</b> · · ·	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$335,480
VM Other Matl & Supplies (Car-villes)  VM Other Matl & Supplies (Peak Cars)		ψ0.04				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE			1			ψ+,113	i cak cais		1.000	ψ+,113	1.047	ψ+,510.30	ψ00,333
NVM Salaries & Wages (Route-Mi)				\$36,531	I	Т	Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,295,406
NVM Salaries & Wages (Notice-Mi)				ψ50,551	\$45,251	1	Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Yards)			\$406,114		ψ <del>1</del> 3,231		Yards	Work Hours	15.727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)			9400,114	\$12,095		1	Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$428,914
NVM Fringe Benefits (Stations Driven)				\$12,093	\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Vard Driven)			\$134,466		ψ14,303		Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)	1		\$134,400	\$12,152		1	Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$430,930
NVM Prof/Tech Services (Route-Wil)				\$12,132	\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Yards)			\$150,340		\$10,570		Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)	1		\$130,340	\$7,441		1	Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$263,876
NVM Matl & Supplies (Notice-Wil)				\$7,441	\$8,928	1	Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Stations)	1		\$82,257		φ0,920	1	Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous			φ02,237	\$327		1	Route-Mi	37	1.000	\$327	1.047	\$342	\$11,584
GENERAL ADMINISTRATION				\$321			Route-IVII	31	1.000	φ32 <i>1</i>	1.047	\$342	\$11,564
GA Salaries & Wages				ı	ı	\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Salaries & Wages GA Fringe Benefits	+					\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$53.26 \$17.64	\$428,361
GA Prof/Tech Services	1		<del>                                     </del>	<del>                                     </del>		\$56,328	Peak Cars	33	1,735	\$56,328	1.047	\$58,957	\$825,394
GA Prol/Tech Services  GA Matl & Supplies	+		<del> </del>	<del>                                     </del>		\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Mati & Supplies GA Utilities (Stations)	1				\$18,174	\$4,3U/	Stations	22	1.000	\$4,307	1.047	\$4,508 \$19,022	\$323,380
GA Utilities (Stations)  GA Utilities (Yards)	+		\$330,797	<del>                                     </del>	\$10,174	<del>                                     </del>	Yards	1	1.000	\$330,797	1.047	\$19,022	\$346,232
GA Otilities (Yards) GA Casualty & Liability (Stations)	+		\$33U,191		\$10,605	<del>                                     </del>	Stations	22	1.000	\$10,605	1.047	\$11,100	\$346,232
GA Casualty & Liability (Stations)  GA Casualty & Liability (Car-Mi)	1	\$0.16	1		\$10,000	<b>+</b>	Car-Miles	2,572,416	1.000	\$0.16	1.047	\$11,100	\$188,700
GA Casualty & Elability (Car-Wil) GA Taxes & Fees	+	φυ. τυ				\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Taxes & Fees GA Miscellaneous	1					\$45.09 \$15,025	Peak Cars Peak Cars	33	1.000	\$45 \$15,025	1.047	\$47.19 \$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$15,025	i can cals	33	1.000	φ10,02J	1.047	\$10,720	\$17,880,238
2012 Resource Variable Values	\$87.43 87,461	2,572,416	1.4	37.3	\$144,147	33						Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us		2,312,410	1.4	31.3		. 33	l .					Rev Car-Miles	947,800
Vehicle Operations												Peak Cars	947,800
Vehicle Maintenance												Track Miles	33.9
Non-Vehicle Maintenance												Stations	17
General Administration :												Yards	1.0

Durham-Orange Light Rail Transit Project | July 24, 2015 | A-6



#### **Appendix A Table 6**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

#### C2A-NHC LPA

Revenue   Trans-Hour   Carbon   Revenue   Trans-Hour   Trans-Hou						. (00100)		_				Inflati	on Factor:	1.047
Page		B		Supply Variab		ate (2012\$)					Base Year	la final	Results in:	
### CHAPLE OF CREATIONS    Train-Houry   Work Houry   1,586   22,586   1,077   \$2,717   \$2,081,277   \$2,081,2	Evnense I ine Item			Varde		Stations	Poak Care							
VOO-press Saverse & Vagers   \$41.17		Tam-Hours	Jai-Willes	Tarus	Noute-Wil	Stations	reak Gals	variable	value	Supply	Jilli Cost	Factor	Jiii Cost	Ailluai COSI
VOOD-res Salente & Wages (Train-Hot)		\$41.17		1	ı		1	Train Hours	Work Hours	1 506	\$25.06	1.047	\$27.17	\$2,001,227
VO Other Statutes & Wages (Peak Cars)	•													
VO Fringe Benefits (Fram-Hr)		\$12.19					\$22.550							
VO Frienge Benefits (Peak Car)	* ' '	¢17.01					φ32,339							
VO Proffers Services (Tasin-Hy   \$18		Ψ17.01					\$10.865							
VO Proffest Services (Stations)		\$16					ψ10,000							
VOORber Malf & Supplies		φ10				\$29 227								
\[ VOUIIII: (Car-Miles   2.672.416   0.00   \$0.77   1.07   \$0.90   \$0.577   \$0.90   \$0.577   \$0.90   \$0.90   \$0.00   \$0.	, ,	\$0.67				QLO,LL!								
VOLUMENE Preak Carp		\$0.07	\$0.37				1					+		
VOM Microlamenus   S			ψ0.57				\$27 773							
Washings Awages   S1.55   Car-Miles   Work Hours   0.053   \$25.57   1.047   \$26.97   \$1,339.370     Vill Fringe Benefits   \$0.448   Car-Miles   Work Hours   0.053   \$26.77   1.047   \$8.68   \$444.471     Vill Freif A Lubricants   \$0.31   Car-Miles   Work Hours   0.053   \$36.47   1.047   \$8.68   \$444.471     Vill Freif A Lubricants   \$0.31   Car-Miles   Work Hours   0.053   \$36.47   1.047   \$8.68   \$444.471     Vill Freif A Lubricants   \$0.31   Car-Miles   Work Hours   0.053   \$36.47   1.047   \$8.68   \$444.471     Vill Freif A Lubricants   \$0.31   Car-Miles   \$2.72.416   1.000   \$33.211   1.047   \$3.381   \$47.051     Vill Treif A Lubricants   \$0.34   Car-Miles   \$2.72.416   1.000   \$34.211   1.047   \$3.381   \$47.051     Vill Cherr Miles A Supplies (Pawkins   0.053   \$3.241   0.000   \$3.34   1.047   \$5.351   \$38.879     Vill Cherr Miles A Supplies (Pawkins   0.000   \$3.34   0.000		\$0.06					Ψ21,113					_		
VM Salinie & Wages		\$0.00					•	Train Frodro	07,101	1.000	ψ0.00	1.017	ψο.στ	ψο, 17 ο
VM Fringe Benefits			\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1 047	\$26.77	\$1 339 370
VM Perif Carb Genericals   \$0.31	·													
VM Free & Lubricants														
VM Tiese & Tubens   Supplies (Car-Miles)   \$0.34   S0.34   S0.35   S			ψ0.01				\$3.211							
VM Other Mart & Supplies (Peak Cars)   \$0.34   1.047   \$0.35   \$338.879														
VM Order Mort & Supplies (Peak Cars)			\$0.34				Ų							
VM Miscellaneous   S4,119   Peak Cars   S3   1,000   \$4,119   1,047   \$4,310.96   \$60,533   \text{VM Salaries & Wages (Route-Mi)   \$36,631   \$40,000			44101				\$24.987							
ION-VEHICLE MAINTENANCE   Sadafaria & Wages (Route-Mi)   Sadafaria & Wages (Route-Mi)   Sadafaria & Wages (Stations)   Sadafaria & Sadafaria & Wages (Stations)   Sadafaria & Sadafaria & Wages (Stations)   Sadafaria & Sadafar														
NVM Salaries & Wages (Route-Mi) NVM Salaries & Wages (Stations) NVM Fringe Benefits (Route-Mi) NVM Fringe Benefits (Stations Driven) NVM Mala Stations Statio							,				¥ .,		,	****
NVM Salaries & Wages (Yards)					\$36,531		1	Route-Mi	Work Hours	1.395	\$26.18	1.047	\$27.40	\$1,293,112
NVM Salaries & Wages (Yards)   \$406,114   \$12,095   \$406,114   \$12,095   \$14,945   \$406,114   \$15,272   \$25,82   \$1,047   \$27,03   \$425,064   \$10,000   \$15,000   \$10,						\$45,251								
Fringe Benefits (Route-Mi)				\$406,114										
NVM Fringe Benefits (Stations Driven)   \$134,466   \$14,983   Stations   Work Hours   1,721   \$8,71   1,047   \$9,11   \$266,593   \$10,740   \$17,770   \$30,775   \$1,000   \$12,152   1,047   \$1,771   \$3,770   \$30,775   \$3,7					\$12,095							+		
NVM Prol/Tech Services (Route-Mi)   \$12,152   \$1,047   \$12,719   \$430,167   \$1,007   \$12,719   \$430,167   \$1,007   \$12,719   \$1,007   \$12,719   \$1,007   \$10,007   \$	NVM Fringe Benefits (Stations Driven)				, , , , , , , ,	\$14,983		Stations	Work Hours	1,721		1.047	\$9.11	\$266,593
NVM Prol/Tech Services (Stations)   \$16,978   \$11,000   \$16,978   \$1,047   \$17,770   \$302,097	NVM Fringe Benefits (Yard Driven)			\$134,466				Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prol/Tech Services (Yards)   \$150,340   \$7,441   \$7,441   \$7,745   \$10,00   \$150,340   \$1,047   \$157,355   \$157,355   \$157,355   \$157,355   \$157,355   \$157,355   \$157,355   \$157,355   \$157,441   \$1,000   \$1,47   \$7,789   \$263,409   \$150,400   \$1,47   \$1,789   \$263,409   \$150,400   \$1,47   \$1,789   \$263,409   \$150,400   \$1,47   \$1,789   \$263,409   \$150,400   \$1,47   \$1,789   \$263,409   \$150,400   \$1,47   \$1,789   \$263,409   \$150,400   \$1,47   \$1,789   \$263,409   \$150,400   \$1,47   \$1,789   \$1,189	NVM Prof/Tech Services (Route-Mi)				\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$430,167
NVM Prol/Tech Services (Yards)   \$150,340   \$7,441   \$7,785   \$157,355   \$1	NVM Prof/Tech Services (Stations)					\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Matl & Supplies (Stations)   S8,928   Stations   22   1.000   \$8,928   1.047   \$9,345   \$158,862   NVM Matl & Supplies (Yards)   \$82,257   Route-Mi   37   1.000   \$82,257   1.047   \$86,095   \$86,095   NVM Mistle & Supplies (Yards)   \$82,257   Route-Mi   37   1.000   \$82,257   1.047   \$86,095   \$86,095   NVM Mistle & Supplies (Yards)   \$82,257   NVM Mistle & Supplies (Yards)   \$88,290   Route-Mi   37   1.000   \$327   1.047   \$86,095   \$86,095   NVM Mistle & Supplies (Yards)   \$88,290   Peak Cars   Work Hours   1,735   \$50,90   1.047   \$53,28   \$1,293,735   \$1,293,73	NVM Prof/Tech Services (Yards)			\$150,340				Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Yards)   \$82,257     Route-Mi   37   1.000   \$82,257   1.047   \$86,095   \$86,095     NVM Miscellaneous   \$327     Route-Mi   37   1.000   \$327   1.047   \$342   \$11,564     SEMERAL ADMINISTRATION     GA Salaries & Wages					\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$263,409
NVM Miscellaneous \$327   Route-Mil 37   1.000   \$327   1.047   \$342   \$11,564	NVM Matl & Supplies (Stations)					\$8,928		Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
## SEMERAL ADMINISTRATION  GA Salaries & Wages  GA Fringe Benefits  GA Fringe Benefits  GA Fringe Benefits  GA Proff Fech Services  GA Work Hours  \$29,233  Peak Cars  Work Hours  \$1,735  \$16.85  \$1.047  \$17.64  \$4,283,315  \$6,328  Peak Cars  Work Hours  \$1,735  \$16.85  \$1.047  \$17.64  \$4,283,315  \$6,328  Peak Cars  \$33  \$1.000  \$56,328  \$1.047  \$53,957  \$825,394  \$6,307  Peak Cars  \$33  \$1.000  \$4,307  \$1.047  \$4,508  \$6,3110  GA Utilities (Stations)  GA Utilities (Stations)  GA Utilities (Stations)  GA Casualty & Liability (Stations)  GA Casualty & Liability (Car-Mi)  \$0,16  \$0,16  \$0,16  \$0,16  \$0,16  \$0,17  \$11,00  \$10,605  \$10,47  \$11,100  \$11,07  \$11,100  \$118,700  \$11,07  \$11,100  \$11,07	NVM Matl & Supplies (Yards)			\$82,257				Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
GA Salaries & Wages GA Fringe Benefits S29,233 Peak Cars Work Hours 1,735 \$50,90 1,047 \$53,28 \$1,293,735 GA Fringe Benefits S29,233 Peak Cars Work Hours 1,735 \$50,90 1,047 \$53,28 \$1,293,735 \$4,293,7	NVM Miscellaneous				\$327			Route-Mi	37	1.000	\$327	1.047	\$342	\$11,564
GA Fringe Benefits   \$29,233   Peak Cars   Work Hours   1,735   \$16.85   1.047   \$17.64   \$428,361   GA Prol/Fech Services   \$56,328   Peak Cars   33   1.000   \$56,328   1.047   \$55,957   \$825,394   GA Matl & Supplies   \$4,307   Peak Cars   33   1.000   \$43,070   1.047   \$59,957   \$825,394   GA Utilities (Stations)   \$18,174   \$18,174   \$18,174   \$18,000   \$18,174   \$1.047   \$19,022   \$323,380   GA Utilities (Yards)   \$330,797   \$1   \$10,005   \$10,005   \$10,007   \$14,170   \$19,022   \$323,380   GA Casualty & Liability (Stations)   \$10,005   \$10,005   \$10,007   \$14,170   \$18,070   GA Casualty & Liability (Car-Mi)   \$0,16   \$0,16   \$10,00   \$10,005   \$10,007   \$11,100   \$188,700   GA Taxes & Fees   \$0   \$0   \$0,16   \$1,047   \$0,17   \$163,106   GA Taxes & Fees   \$0   \$0   \$15,025   \$10,00   \$15,025   \$10,00   \$15,025   \$10,00   GA Miscellaneous   \$15,025   Peak Cars   \$33   1,000   \$45   1,047   \$47,19   \$660,65   GOZALS   \$87,43   \$2.98   \$1,103,974   \$68,546   \$144,147   \$296,889    **Traingle Transit agency fringe benefit rates used:  Vehicle Operations = \$33,37%   Vehicle Maintenance = \$31,11%   \$10,00   \$10,00   \$10,00   \$10,00   \$10,00    **Rev Car-Miles   \$14   \$10,00	GENERAL ADMINISTRATION													
GA Prol/Tech Services GA Mati & Supplies GA Mati & Supplies GA Mati & Supplies GA Mati & Supplies GA Matifies (Stations) GA Utilities (Yards) GA Casualty & Liability (Stations) GA Casualty & Liability (Car-Mi) GA Casualty & Liabili	GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Matl & Supplies GA Matl & Supplies GA Utilities (Stations) GA Utilities (Stations) GA Casualty & Liability (Stations) GA Casualty & Liability (Car-Mi) GA Taxes & Fees GA Miscellaneous GA Taxes & Fees GA Miscellaneous GA Miscellaneous GA Miscellaneous GA Miscellaneous GA Casualty & Liability (Car-Mi) GA Miscellaneous GA Taxes & Fees GA Taxes & Fees GA Miscellaneous GA Taxes & Fees GA	GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Utilities (Stations) \$18,174 \$18,174 \$18,174 \$18,174 \$19,022 \$323,380 \$30,797 \$1 \$18,174 \$1,000 \$18,174 \$1,047 \$19,022 \$323,380 \$30,797 \$1 \$10,000	GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Casualty & Liability (Stations) \$330,797 \$	GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Casualty & Liability (Stations)  GA Casualty & Liability (Car-Mi)  SOLID	GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Casualty & Liability (Car-Mi) \$0.16 \$0.16 \$0.16 \$0.16 \$0.16 \$0.17 \$0.17 \$163,106 \$0.17	GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Taxes & Fees	GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Miscellaneous \$15,025 Peak Cars 33 1.000 \$15,025 1.047 \$15,726 \$220,158 \$101 Resource Variable Values \$7,43 \$2,98 \$1,103,974 \$68,546 \$144,147 \$296,889 \$101 Resource Variable Values \$7,461 \$2,572,416 \$1.4 \$37.3 \$22 \$33 \$1.000 \$15,025 \$1.047 \$15,726 \$220,158 \$17,706,626 \$101 Resource Variable Values \$17,401 \$2,572,416 \$1.4 \$37.3 \$22 \$33 \$1.000 \$15,025 \$1.047 \$15,726 \$220,158 \$101 Resource Variable Values \$17,401 \$1.047 \$1.04	GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$163,106
STALES	GA Taxes & Fees						\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
1.012 Resource Variable Values	GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
Rev Car-Miles   946,100   Yehicle Operations =   33.37%   Peak Cars   14   Track Miles   33.11%   Track Miles   33.11%   Track Miles   33.11%   Stations   17   Stations   1	TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,870,626
Vehicle Operations = 33.37%         Peak Cars         14           Vehicle Maintenance = 33.11%         33.11%         Track Miles 33.8           Non-Vehicle Maintenance = 33.11%         Stations 17	2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33	l					Rev Train-Hrs	48,300
Vehicle Maintenance =         33.11%         Track Miles         33.8           Non-Vehicle Maintenance =         33.11%         Stations         17								-						
Non-Vehicle Maintenance = 33.11% Stations 17	•													
	Non-Vehicle Maintenance : General Administration :												Stations Yards	1.0

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#### **Appendix A Table 7**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

											Inflation	on Factor:	1.047
		Light Rail	Supply Variab	le Unit Cost R	ate (2012\$)		Pro	ductivity Ratio	D	Base Year		Results in:	2015\$
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cost
VEHICLE OPERATIONS													
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$371,283
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE													
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,352,111
VM Fringe Benefits		\$0,448					Car-Miles	Work Hours	0.053	\$8,47	1.047	\$8.86	\$447.689
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$307,623
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34				****	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$338,064
VM Other Matl & Supplies (Peak Cars)		ψο.σ ι				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE			1			ψ-,113	i cak cais		1.000	ψ+,113	1.047	ψ+,510.50	ψ00,555
NVM Salaries & Wages (Route-Mi)				\$36,531		Т	Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,305,347
NVM Salaries & Wages (Notice-Mi)				ψ50,551	\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Vards)			\$406,114		ψ+3,231		Yards	Work Hours	15.727	\$25.82	1.047	\$27.03	\$425.064
Fringe Benefits (Route-Mi Driven)			\$400,114	\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$432,206
NVM Fringe Benefits (Stations Driven)	1			\$12,095	\$14,983	1	Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Stations Driven)	+		\$134,466		g14,503	<del>                                     </del>	Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)			\$134,400	\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$434,237
NVM Prof/Tech Services (Route-Wil)	+			φ12,132	\$16,978	1	Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Stations)	+		\$150,340		\$10,576	<b>-</b>	Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)			\$150,340	\$7,441		<b>-</b>	Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$265,901
				\$7,441	#0.000	1		22	1.000	- '	1.047		
NVM Matl & Supplies (Stations)	+		\$00.0E7		\$8,928	<b>—</b>	Stations		1.000	\$8,928	1.047	\$9,345	\$158,862 \$86,095
NVM Matl & Supplies (Yards)			\$82,257	6007	-	1	Yards	37		\$82,257		\$86,095	
NVM Miscellaneous GENERAL ADMINISTRATION			1	\$327	L		Route-Mi	3/	1.000	\$327	1.047	\$342	\$11,673
		1		ı		#00.000	Deal Oraș	Marie Herri	4.705	<b>650.00</b>	4.047	650.00	£4 000 70F
GA Salaries & Wages	+				-	\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits	+		-			\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services	+				-	\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies	+		-		640 474	\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)	+		6000 70-		\$18,174	<b>—</b>	Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)	1		\$330,797		640.005	-	Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)	+	£0.16	-		\$10,605	-	Stations Cor Miles	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)	1	\$0.16				645.00	Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$164,658
GA Taxes & Fees	+		-		<u> </u>	\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous	607.40	<b>#0.00</b>	64 400 07 1	#00 F46	644444	\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,921,679
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33	l					Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us												Rev Car-Miles	955,100
Vehicle Operations												Peak Cars	14
Vehicle Maintenance : Non-Vehicle Maintenance :												Track Miles Stations	34.1 17
General Administration												Yards	1.0



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#### **Appendix A Table 8**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

											Inflation	on Factor:	1.047
		Light Rail	Supply Variab	le Unit Cost R	ate (2012\$)		Pro	ductivity Ratio	)	Base Year		Results in:	2015\$
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
xpense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cos
EHICLE OPERATIONS											-		
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$376,920
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
EHICLE MAINTENANCE					•								
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,372,638
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$454,486
VM Prof/Tech Services	1	\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$312,293
VM Fuel & Lubricants		40.0				\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34	1			Ų	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$343,197
VM Other Matl & Supplies (Car-Miles)		ψ0.54				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous	1					\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
ION-VEHICLE MAINTENANCE		l	l			φ4,119	Feak Cais	33	1.000	φ <del>4</del> ,115	1.047	φ4,310.90	\$00,333
NVM Salaries & Wages (Route-Mi)		ı	ı	\$36,531	г		Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,325,230
NVM Salaries & Wages (Rodie-Wil)	+			φ30,331	\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Stations)			\$406.114		\$45,251		Yards	Work Hours	15.727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)			\$406,114	\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$425,064
				\$12,095	644.000								
NVM Fringe Benefits (Stations Driven)	1		2121122		\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Yard Driven)	1		\$134,466	212122			Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)	1			\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$440,851
NVM Prof/Tech Services (Stations)	1				\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Yards)			\$150,340				Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)				\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$269,951
NVM Matl & Supplies (Stations)					\$8,928		Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257				Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous				\$327	L		Route-Mi	37	1.000	\$327	1.047	\$342	\$11,851
GENERAL ADMINISTRATION				1			1						
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$167,158
GA Taxes & Fees						\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$18,004,24
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33						Rev Train-Hrs	48,300
riangle Transit agency fringe benefit rates us	sed:				-	-						Rev Car-Miles	969,600
Vehicle Operations :												Peak Cars	14
Vehicle Maintenance												Track Miles	34.7
Non-Vehicle Maintenance												Stations	17
General Administration :	= 33.11%											Yards	1.0



### **Appendix A Table 9**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

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											Inflati	on Factor:	1.047
			Supply Variab	le Unit Cost Ra	ate (2012\$)			oductivity Ratio		Base Year		Results in:	
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cost
VEHICLE OPERATIONS					1					1			
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$375,171
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE													
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,366,267
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$452,377
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$310,844
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34				***	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$341,604
VM Other Matl & Supplies (Peak Cars)		40.0.				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE						ψ <del>1</del> ,113	i cak oais	- 55	1.000	ψ+,113	1.047	φ+,510.50	400,000
NVM Salaries & Wages (Route-Mi)				\$36,531		1	Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,319,112
NVM Salaries & Wages (Stations)				ψ30,331	\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Stations)			\$406,114		ψ4J,2J1		Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)			\$400,114	\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$436,763
NVM Fringe Benefits (Stations Driven)				\$12,095	\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.07	\$266,593
NVM Fringe Benefits (Stations Driven)			\$134,466		\$14,505		Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)			\$134,400	\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$438,816
NVM Prof/Tech Services (Route-Wil)				\$12,152	\$16,978		Stations	22	1.000	\$12,152	1.047	\$17,770	\$302.097
NVM Prof/Tech Services (Stations)  NVM Prof/Tech Services (Yards)			\$150,340		\$16,978	1	Yards	1	1.000	\$150,340	1.047	\$17,770	\$302,097 \$157,355
NVM Matl & Supplies (Route-Mi)			\$150,340	\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$268,705
				\$7,441	#0.000	1		22					
NVM Matl & Supplies (Stations)			600.057		\$8,928		Stations		1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257	****			Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous				\$327		L	Route-Mi	37	1.000	\$327	1.047	\$342	\$11,796
GENERAL ADMINISTRATION					1			I					
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$166,382
GA Taxes & Fees						\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,978,723
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33	l					Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us												Rev Car-Miles	965,100
Vehicle Operations =												Peak Cars	14
Vehicle Maintenance =												Track Miles	34.5
Non-Vehicle Maintenance =												Stations	17
General Administration =	33.11%											Yards	1.0



#### **Appendix A Table 10**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

C2A-NHC 1

	Revenue Train-Hours \$41.17 \$12.19 \$17.81 \$16 \$0.67 \$0.06	Revenue Car-Miles  \$0.37  \$1.35 \$0.448	Yards  Yards	le Unit Cost Ra Revenue Route-Mi	Stations  \$29,227	\$32,559 \$10,865 \$27,773	Resource Variable  Train-Hours Train-Hours Peak Cars Train-Hours Peak Cars Train-Hours Train-Hours Train-Hours Car-Miles	Work Hours 22 87,461 2,572,416	1.586 0.416 1138 2.002 1,138 1.000 1.000	Base Year Resource Unit Cost \$25.96 \$29.28 \$28.60 \$8.89 \$9.54 \$15.53 \$29,227 \$0.67	1.047 1.047 1.047 1.047 1.047 1.047 1.047 1.047 1.047	Results in: Resource Unit Cost  \$27.17 \$30.65 \$29.94 \$9.31 \$9.99 \$16.26 \$30.591 \$0.70	2015\$ Estimated Annual Cost  \$2,081,327 \$616,456 \$477,094 \$900,287 \$159,213 \$785,266 \$520,049 \$33,650
Expense Line Item Ti VEHICLE OPERATIONS VEHICLE OPERATIONS VO Operator Salaries & Wages VO Other Salaries & Wages (Train-Hr) VO Other Salaries & Wages (Peak Cars) VO Fringe Benefits (Train-Hr) VO Fringe Benefits (Peak Car) VO Prof/Tech Services (Train-Hr) VO Other Matl & Supplies VO Utilities (Car-Mr) VO Utilities (Car-Mr) VO Utilities (Peak Cars) VO Miscellaneous VEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes	\$41.17 \$12.19 \$17.81 \$16 \$0.67	\$0.37	Yards			\$32,559 \$10,865	Train-Hours Train-Hours Peak Cars Train-Hours Peak Cars Train-Hours Stations Train-Hours	Work Hours Work Hours Work Hours Work Hours Work Hours Work Hours 22 87,461	1.586 0.416 1138 2.002 1,138 1.000 1.000	\$25.96 \$29.28 \$28.60 \$8.89 \$9.54 \$15.53 \$29,227	1.047 1.047 1.047 1.047 1.047 1.047 1.047	\$27.17 \$30.65 \$29.94 \$9.31 \$9.99 \$16.26 \$30,591	\$2,081,327 \$616,456 \$477,094 \$900,287 \$159,213 \$785,266 \$520,049
VEHICLE OPERATIONS  VO Operator Salaries & Wages  VO Other Salaries & Wages (Train-Hr)  VO Other Salaries & Wages (Peak Cars)  VO Fringe Benefits (Train-Hr)  VO Fringe Benefits (Feak Car)  VO Prof/Tech Services (Train-Hr)  VO Prof/Tech Services (Stations)  VO Other Matl & Supplies  VO Utilities (Peak Cars)  VO Miscellaneous  VEHICLE MAINTENANCE  VM Salaries & Wages  VM Fringe Benefits  VM Prof/Tech Services  VM Fringe Benefits  VM Fringe Benefits  VM Fringe Services  VM Fringe & Tubes	\$41.17 \$12.19 \$17.81 \$16 \$0.67	\$0.37 \$1.35	Yards	Route-Mi		\$32,559 \$10,865	Train-Hours Train-Hours Peak Cars Train-Hours Peak Cars Train-Hours Stations Train-Hours	Work Hours Work Hours Work Hours Work Hours Work Hours 87,461 22 87,461	1.586 0.416 1138 2.002 1,138 1.000 1.000	\$25.96 \$29.28 \$28.60 \$8.89 \$9.54 \$15.53 \$29,227	1.047 1.047 1.047 1.047 1.047 1.047	\$27.17 \$30.65 \$29.94 \$9.31 \$9.99 \$16.26 \$30,591	\$2,081,327 \$616,456 \$477,094 \$900,287 \$159,213 \$785,266 \$520,049
VO Operator Salaries & Wages VO Other Salaries & Wages (Yo Other Salaries & Wages (Train-Hr) VO Other Salaries & Wages (Peak Cars) VO Fringe Benefits (Train-Hr) VO FrofTech Services (Train-Hr) VO ProfTech Services (Stations) VO Other Matl & Supplies VO Utilities (Peak Cars) VO Utilities (Peak Cars) VO Miscellaneous VEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM ProfTech Services VM Fries & Utbricants VM Fires & Tubes	\$12.19 \$17.81 \$16 \$0.67	\$1.35			\$29,227	\$10,865	Train-Hours Peak Cars Train-Hours Peak Cars Train-Hours Stations Train-Hours	Work Hours Work Hours Work Hours Work Hours 87,461 22 87,461	0.416 1138 2.002 1,138 1.000 1.000	\$29.28 \$28.60 \$8.89 \$9.54 \$15.53 \$29,227	1.047 1.047 1.047 1.047 1.047 1.047	\$30.65 \$29.94 \$9.31 \$9.99 \$16.26 \$30,591	\$616,456 \$477,094 \$900,287 \$159,213 \$785,266 \$520,049
VO Other Salaries & Wages (Train-Hr) VO Other Salaries & Wages (Peak Cars) VO Fringe Benefits (Train-Hr) VO Fringe Benefits (Peak Car) VO Prof/Tech Services (Train-Hr) VO Other Matl & Supplies VO Utilities (Car-Mr) VO Utilities (Car-Mr) VO Utilities (Peak Cars) VO Miscellaneous VEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Full & Lubricants VM Tires & Tubes	\$12.19 \$17.81 \$16 \$0.67	\$1.35			\$29,227	\$10,865	Train-Hours Peak Cars Train-Hours Peak Cars Train-Hours Stations Train-Hours	Work Hours Work Hours Work Hours Work Hours 87,461 22 87,461	0.416 1138 2.002 1,138 1.000 1.000	\$29.28 \$28.60 \$8.89 \$9.54 \$15.53 \$29,227	1.047 1.047 1.047 1.047 1.047 1.047	\$30.65 \$29.94 \$9.31 \$9.99 \$16.26 \$30,591	\$616,456 \$477,094 \$900,287 \$159,213 \$785,266 \$520,049
VO Other Salaries & Wages (Peak Cars)  VO Fringe Benefits (Train-Hr)  VO Fringe Benefits (Peak Car)  VO Prof/Tech Services (Train-Hr)  VO Prof/Tech Services (Stations)  VO Other Mati & Supplies  VO Utilities (Peak Cars)  VO Miscellaneous  VO Miscellaneous  VOHICLE MAINTENANCE  VM Salaries & Wages  VM Fringe Benefits  VM Prof/Tech Services  VM Fries & Tubricants  VM Tires & Tubes	\$17.81 \$16 \$0.67	\$1.35			\$29,227	\$10,865	Peak Cars Train-Hours Peak Cars Train-Hours Stations Train-Hours	Work Hours Work Hours Work Hours 87,461 22 87,461	1138 2.002 1,138 1.000 1.000	\$28.60 \$8.89 \$9.54 \$15.53 \$29,227	1.047 1.047 1.047 1.047 1.047	\$29.94 \$9.31 \$9.99 \$16.26 \$30,591	\$477,094 \$900,287 \$159,213 \$785,266 \$520,049
VO Fringe Benefits (Train-Hr)  VO Fringe Benefits (Peak Car)  VO Prof/Tech Services (Train-Hr)  VO Prof/Tech Services (Stations)  VO Other Matl & Supplies  VO Utilities (Peak Cars)  VO Miscellaneous  VEHICLE MAINTENANCE  VM Salaries & Wages  VM Fringe Benefits  VM Prof/Tech Services  VM Fule & Lubricants  VM Fules & Lubricants  VM Fires & Tubes	\$16 \$0.67	\$1.35			\$29,227	\$10,865	Train-Hours Peak Cars Train-Hours Stations Train-Hours	Work Hours Work Hours 87,461 22 87,461	2.002 1,138 1.000 1.000	\$8.89 \$9.54 \$15.53 \$29,227	1.047 1.047 1.047 1.047	\$9.31 \$9.99 \$16.26 \$30,591	\$900,287 \$159,213 \$785,266 \$520,049
VO Fringe Benefits (Peak Car)  VO Prof/Tech Services (Train-Hr)  VO Prof/Tech Services (Stations)  VO Other Matl & Supplies  VO Utilities (Car-Mr)  VO Utilities (Peak Cars)  VO Miscellaneous  VEHICLE MAINTENANCE  VM Salaries & Wages  VM Fringe Benefits  VM Prof/Tech Services  VM Fuel & Lubricants  VM Tires & Tubes	\$16 \$0.67	\$1.35			\$29,227		Peak Cars Train-Hours Stations Train-Hours	Work Hours 87,461 22 87,461	1,138 1.000 1.000	\$9.54 \$15.53 \$29,227	1.047 1.047 1.047	\$9.99 \$16.26 \$30,591	\$159,213 \$785,266 \$520,049
VO Prof/Tech Services (Train-Hr) VO Prof/Tech Services (Stations) VO Other Matl & Supplies VO Utilities (Car-Mi) VO Utilities (Peak Cars) VO Miscellaneous VYEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Full & Lubricants VM Tires & Tubes	\$0.67	\$1.35			\$29,227		Train-Hours Stations Train-Hours	87,461 22 87,461	1.000 1.000	\$15.53 \$29,227	1.047 1.047	\$16.26 \$30,591	\$785,266 \$520,049
VO Prof/Tech Services (Stations)  VO Other Matl & Supplies  VO Utilities (Car-Mi)  VO Utilities (Peak Cars)  VO Miscellaneous  VEHICLE MAINTENANCE  VM Salaries & Wages  VM Fringe Benefits  VM Prof/Tech Services  VM Ful & Lubricants  VM Tires & Tubes	\$0.67	\$1.35			\$29,227	\$27,773	Stations Train-Hours	22 87,461	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies VO Utilities (Car-Mi) VO Utilities (Peak Cars) VO Miscellaneous VEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes		\$1.35			\$29,227	\$27,773	Train-Hours	87,461		_			
VO Utilities (Car-Mi) VO Utilities (Peak Cars) VO Miscellaneous VEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes		\$1.35				\$27,773			1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Peak Cars) VO Miscellaneous VYEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Fries & Tubricants VM Tires & Tubes	\$0.06	\$1.35				\$27,773	Car-Miles	2 572 442					\$55,050
VO Miscellaneous VEHICLE MAINTENANCE VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes	\$0.06					\$27,773		2,5/2,416	1.000	\$0.37	1.047	\$0.39	\$374,549
VEHICLE MAINTENANCE  VM Salaries & Wages  VM Fringe Benefits  VM Prof/Tech Services  VM Fuel & Lubricants  VM Tires & Tubes	\$0.06						Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VM Salaries & Wages VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes							Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes						•	•						
VM Fringe Benefits VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes							Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,364,002
VM Prof/Tech Services VM Fuel & Lubricants VM Tires & Tubes							Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$451,627
VM Fuel & Lubricants VM Tires & Tubes		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$310,328
VM Tires & Tubes						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2.155
		\$0.34				****	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$341,038
VM Other Matl & Supplies (Peak Cars)		40.0				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE						<b>ψ</b> 1,110	r dan dard	- 00	1.000	<b>\$1,110</b>	1.017	ψ1,010.00	\$00,000
NVM Salaries & Wages (Route-Mi)	1		l .	\$36,531			Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,316,818
NVM Salaries & Wages (Stations)				ψ50,551	\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Stations)  NVM Salaries & Wages (Yards)			\$406,114		ψ4J,2J1		Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)			9400,114	\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$436,004
NVM Fringe Benefits (Stations Driven)				\$12,095	\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.07	\$266,593
NVM Fringe Benefits (Stations Driven)			\$134,466		\$14,503		Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Pringe Beriefits (Yard Driveri)  NVM Prof/Tech Services (Route-Mi)			\$134,466	\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$438,053
NVM Prof/Tech Services (Route-Wil)				\$12,152	\$16,978		Stations	22	1.000	\$16,978	1.047	\$12,719	\$302.097
NVM Prof/Tech Services (Stations)  NVM Prof/Tech Services (Yards)			\$150,340		\$16,978		Yards	1	1.000	\$150,340	1.047	\$17,770	\$302,097 \$157,355
NVM Matl & Supplies (Route-Mi)			\$150,340	\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$268,238
				\$7,441	#0.000	-		22			1.047		
NVM Matl & Supplies (Stations)			\$82,257		\$8,928		Stations		1.000	\$8,928		\$9,345	\$158,862
NVM Matl & Supplies (Yards)  NVM Miscellaneous			\$82,257	6007			Yards Route-Mi	1 37	1.000	\$82,257	1.047	\$86,095	\$86,095 \$11,776
			ļ	\$327			Route-IVII	3/	1.000	\$327	1.047	\$342	\$11,776
GENERAL ADMINISTRATION			ı	ı	1	****			4 707	250.00		250.00	21.000.00
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$166,106
GA Taxes & Fees						\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,969,424
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33	ļ					Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates used:												Rev Car-Miles	963,500
Vehicle Operations =	33.37%											Peak Cars	14
Vehicle Maintenance = Non-Vehicle Maintenance =	33.11% 33.11%											Track Miles Stations	34.4 17
Non-vehicle Maintenance = General Administration =	33.11% 33.11%											Stations Yards	1.0

Durham-Orange Light Rail Transit Project | July 24, 2015 | A-11



#### **Appendix A Table 11**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

C1-NHC 2

											Inflati	on Factor:	1.047
			Supply Variab	le Unit Cost Ra	ate (2012\$)			ductivity Ratio		Base Year		Results in:	2015\$
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cos
VEHICLE OPERATIONS		1		1			1						
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$369,767
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE													
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,346,589
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$445,861
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$306,367
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34					Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$336,684
VM Other Matl & Supplies (Peak Cars)						\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE													
NVM Salaries & Wages (Route-Mi)				\$36,531			Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,299,994
NVM Salaries & Wages (Stations)					\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Yards)			\$406,114				Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)				\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$430,434
NVM Fringe Benefits (Stations Driven)					\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Yard Driven)			\$134,466				Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)				\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$432,457
NVM Prof/Tech Services (Stations)					\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Yards)			\$150,340		,		Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)				\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$264,811
NVM Matl & Supplies (Stations)				- /	\$8,928		Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257		,		Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous				\$327		1	Route-Mi	37	1.000	\$327	1.047	\$342	\$11,625
GENERAL ADMINISTRATION						•							
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174	T .,	Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797		*,	1	Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)			, /		\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16			,000		Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$163,986
GA Taxes & Fees		ψ0.10				\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889				,,		,,	\$17,899,461
2012 Resource Variable Values	87.461	2,572,416	1.4	37.3	22	33						Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us		_,0.2,0		00		,	l)					Rev Car-Miles	951,200
Vehicle Operations =												Peak Cars	14
Vehicle Maintenance												Track Miles	34.0
Non-Vehicle Maintenance =												Stations	17
General Administration =	33.11%											Yards	1.0



#### **Appendix A Table 12**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

C1A-NHC 2

											Inflatio	on Factor:	1.047
			Supply Variab	le Unit Cost Ra	ate (2012\$)			ductivity Ratio		Base Year		Results in:	
	Revenue	Revenue		Revenue	a		Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cos
VEHICLE OPERATIONS					1		1						
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$375,171
VO Utilities (Peak Cars)						\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06						Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE													
VM Salaries & Wages		\$1.35					Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,366,267
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$452,377
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$310,844
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34				****	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$341,604
VM Other Matl & Supplies (Peak Cars)		44141				\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE						ψ1,110	1 dan dard	- 55	1.000	<b>\$1,110</b>	1.017	ψ1,010.00	\$00,000
NVM Salaries & Wages (Route-Mi)			l .	\$36,531		1	Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,319,112
NVM Salaries & Wages (Stations)				ψ50,551	\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Stations)			\$406,114		φ43,231		Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)			\$400,114	\$12,095		1	Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$436,763
NVM Fringe Benefits (Stations Driven)				\$12,095	\$14,983	-	Stations	Work Hours	1,721	\$8.71	1.047	\$9.07	\$266,593
NVM Fringe Benefits (Stations Driven)  NVM Fringe Benefits (Yard Driven)			\$134,466		\$14,963	1		Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
			\$134,400	640.450		1	Yards	37			1.047		
NVM Prof/Tech Services (Route-Mi)				\$12,152	210.000		Route-Mi		1.000	\$12,152		\$12,719	\$438,816
NVM Prof/Tech Services (Stations)			2152212		\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Yards)			\$150,340			1	Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)				\$7,441	4		Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$268,705
NVM Matl & Supplies (Stations)					\$8,928		Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257				Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous			ļ	\$327		<u> </u>	Route-Mi	37	1.000	\$327	1.047	\$342	\$11,796
GENERAL ADMINISTRATION					1							1	
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$166,382
GA Taxes & Fees						\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,978,723
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33						Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us	ed:						-					Rev Car-Miles	965,100
Vehicle Operations =												Peak Cars	14
Vehicle Maintenance =	33.11%											Track Miles	34.5
Non-Vehicle Maintenance =												Stations	17
General Administration =	33.11%											Yards	1.0

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#### **Appendix A Table 13**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

C2-NHC 2

											Inflatio	on Factor:	1.047
	_		Supply Variab	le Unit Cost Ra	ite (2012\$)			ductivity Ratio		Base Year		Results in:	2015\$
Expense Line Item	Revenue Train-Hours	Revenue Car-Miles	Yards	Revenue Route-Mi	Stations	Peak Cars	Resource Variable	Resource Value	Resource/ Supply	Resource Unit Cost	Inflation Factor	Resource Unit Cost	Estimated Annual Cos
VEHICLE OPERATIONS	Train-nours	Car-willes	Tarus	Route-IVII	Stations	reak Cars	Variable	value	Supply	Unit Cost	Factor	Unit Cost	Annual Cos
VO Operator Salaries & Wages	\$41.17		ı	ı		1	Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Train-Fi)  VO Other Salaries & Wages (Peak Cars)	\$12.19					\$32,559	Peak Cars	Work Hours	1138	\$29.20	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81					φ32,339	Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)	ψ17.01					\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16					ψ10,000	Train-Hours	87,461	1,000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)	\$10				\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67				QEO,EE,		Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)	\$0.07	\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$373,421
VO Utilities (Peak Cars)		ψυ.υτ				\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29.069	\$406,965
VO Miscellaneous	\$0.06					ψ27,770	Train-Hours	87.461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE								,		******		44.01	4-,
VM Salaries & Wages		\$1.35	l	l		I I	Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,359,897
VM Fringe Benefits		\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$450,267
VM Prof/Tech Services		\$0.31					Car-Miles	2,572,416	1.000	\$0.31	1.047	\$0.32	\$309,394
VM Fuel & Lubricants		40.0.				\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes						\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34					Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$340,011
VM Other Matl & Supplies (Peak Cars)						\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE													
NVM Salaries & Wages (Route-Mi)				\$36,531			Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,312,994
NVM Salaries & Wages (Stations)					\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Yards)			\$406,114				Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)				\$12,095		Ĭ .	Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$434,738
NVM Fringe Benefits (Stations Driven)					\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Yard Driven)			\$134,466				Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)				\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$436,781
NVM Prof/Tech Services (Stations)					\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Yards)			\$150,340				Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)				\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$267,459
NVM Matl & Supplies (Stations)					\$8,928		Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257				Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous				\$327			Route-Mi	37	1.000	\$327	1.047	\$342	\$11,742
GENERAL ADMINISTRATION													
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1.000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174		Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Yards)			\$330,797				Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)					\$10,605		Stations	22	1.000	\$10,605	1.047	\$11,100	\$188,700
GA Casualty & Liability (Car-Mi)		\$0.16					Car-Miles	2,572,416	1.000	\$0.16	1.047	\$0.17	\$165,606
GA Taxes & Fees						\$45.09	Peak Cars	33	1.000	\$45	1.047	\$47.19	\$660.65
GA Miscellaneous						\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,953,197
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33						Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us												Rev Car-Miles	960,600
Vehicle Operations												Peak Cars	14
Vehicle Maintenance												Track Miles	34.3 17
Non-Vehicle Maintenance :	= 33.11%											Stations	

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#### **Appendix A Table 14**

Durham-Orange County Corridor Triangle Regional Transit Program O&M Cost Models LIGHT RAIL LINE ITEM DETAIL

											Inflati	on Factor:	1.047
		Light Rail	Supply Variab	le Unit Cost R	ate (2012\$)		Pro	oductivity Ratio	0	Base Year		Results in:	2015\$
	Revenue	Revenue		Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Train-Hours	Car-Miles	Yards	Route-Mi	Stations	Peak Cars	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cos
VEHICLE OPERATIONS													
VO Operator Salaries & Wages	\$41.17						Train-Hours	Work Hours	1.586	\$25.96	1.047	\$27.17	\$2,081,327
VO Other Salaries & Wages (Train-Hr)	\$12.19						Train-Hours	Work Hours	0.416	\$29.28	1.047	\$30.65	\$616,456
VO Other Salaries & Wages (Peak Cars)						\$32,559	Peak Cars	Work Hours	1138	\$28.60	1.047	\$29.94	\$477,094
VO Fringe Benefits (Train-Hr)	\$17.81						Train-Hours	Work Hours	2.002	\$8.89	1.047	\$9.31	\$900,287
VO Fringe Benefits (Peak Car)						\$10,865	Peak Cars	Work Hours	1,138	\$9.54	1.047	\$9.99	\$159,213
VO Prof/Tech Services (Train-Hr)	\$16						Train-Hours	87,461	1.000	\$15.53	1.047	\$16.26	\$785,266
VO Prof/Tech Services (Stations)					\$29,227		Stations	22	1.000	\$29,227	1.047	\$30,591	\$520,049
VO Other Matl & Supplies	\$0.67						Train-Hours	87,461	1.000	\$0.67	1.047	\$0.70	\$33,650
VO Utilities (Car-Mi)		\$0.37					Car-Miles	2,572,416	1.000	\$0.37	1.047	\$0.39	\$372.838
VO Utilities (Peak Cars)		40.0.				\$27,773	Peak Cars	33	1.000	\$27,773	1.047	\$29,069	\$406,965
VO Miscellaneous	\$0.06					<b>\$</b> =1,110	Train-Hours	87,461	1.000	\$0.06	1.047	\$0.07	\$3,175
VEHICLE MAINTENANCE	ψ0.00		1	1			Train-riours	07,401	1.000	ψ0.00	1.047	ψ0.07	ψ5,175
VM Salaries & Wages	1	\$1.35			l .	1	Car-Miles	Work Hours	0.053	\$25.57	1.047	\$26.77	\$1,357,773
VM Fringe Benefits	1	\$0.448					Car-Miles	Work Hours	0.053	\$8.47	1.047	\$8.86	\$449,564
VM Prof/Tech Services	_	\$0.446			1		Car-Miles	2,572,416	1.000	\$0.47	1.047	\$0.32	\$308,911
	+	\$0.51			1	60.044					_		
VM Fuel & Lubricants						\$3,211	Peak Cars	33	1.000	\$3,211	1.047	\$3,361	\$47,051
VM Tires & Tubes	-					\$147	Peak Cars	33	1.000	\$147	1.047	\$154	\$2,155
VM Other Matl & Supplies (Car-Miles)		\$0.34				****	Car-Miles	2,572,416	1.000	\$0.34	1.047	\$0.35	\$339,480
VM Other Matl & Supplies (Peak Cars)	1				ļ	\$24,987	Peak Cars	33	1.000	\$24,987	1.047	\$26,153	\$366,146
VM Miscellaneous						\$4,119	Peak Cars	33	1.000	\$4,119	1.047	\$4,310.96	\$60,353
NON-VEHICLE MAINTENANCE	ļ.,												
NVM Salaries & Wages (Route-Mi)				\$36,531			Route-Mi	Work Hours	1,395	\$26.18	1.047	\$27.40	\$1,310,700
NVM Salaries & Wages (Stations)					\$45,251		Stations	Work Hours	1,721	\$26.30	1.047	\$27.52	\$805,162
NVM Salaries & Wages (Yards)			\$406,114				Yards	Work Hours	15,727	\$25.82	1.047	\$27.03	\$425,064
Fringe Benefits (Route-Mi Driven)				\$12,095			Route-Mi	Work Hours	1,395	\$8.67	1.047	\$9.07	\$433,978
NVM Fringe Benefits (Stations Driven)					\$14,983		Stations	Work Hours	1,721	\$8.71	1.047	\$9.11	\$266,593
NVM Fringe Benefits (Yard Driven)			\$134,466				Yards	Work Hours	15,727	\$8.55	1.047	\$8.95	\$140,740
NVM Prof/Tech Services (Route-Mi)				\$12,152			Route-Mi	37	1.000	\$12,152	1.047	\$12,719	\$436,018
NVM Prof/Tech Services (Stations)					\$16,978		Stations	22	1.000	\$16,978	1.047	\$17,770	\$302,097
NVM Prof/Tech Services (Yards)			\$150,340				Yards	1	1.000	\$150,340	1.047	\$157,355	\$157,355
NVM Matl & Supplies (Route-Mi)				\$7,441			Route-Mi	37	1.000	\$7,441	1.047	\$7,789	\$266,992
NVM Matl & Supplies (Stations)					\$8,928		Stations	22	1.000	\$8,928	1.047	\$9,345	\$158,862
NVM Matl & Supplies (Yards)			\$82,257				Yards	1	1.000	\$82,257	1.047	\$86,095	\$86,095
NVM Miscellaneous				\$327			Route-Mi	37	1.000	\$327	1.047	\$342	\$11,721
GENERAL ADMINISTRATION													
GA Salaries & Wages						\$88,290	Peak Cars	Work Hours	1,735	\$50.90	1.047	\$53.28	\$1,293,735
GA Fringe Benefits						\$29,233	Peak Cars	Work Hours	1,735	\$16.85	1.047	\$17.64	\$428,361
GA Prof/Tech Services						\$56,328	Peak Cars	33	1,000	\$56,328	1.047	\$58,957	\$825,394
GA Matl & Supplies						\$4,307	Peak Cars	33	1.000	\$4,307	1.047	\$4,508	\$63,110
GA Utilities (Stations)					\$18,174	₩ <del>1</del> ,507	Stations	22	1.000	\$18,174	1.047	\$19,022	\$323,380
GA Utilities (Stations)  GA Utilities (Yards)			\$330,797		ψ10,174		Yards	1	1.000	\$330,797	1.047	\$346,232	\$346,232
GA Casualty & Liability (Stations)	_		φ330,/9/		\$10,605	1	Stations	22	1.000	\$10,605	1.047	\$346,232 \$11,100	\$346,232
, , , , ,	_	\$0.16		<b>-</b>	\$10,005	1	Car-Miles	2,572,416	1.000	\$10,605	1.047	\$11,100	\$188,700 \$165,348
GA Casualty & Liability (Car-Mi)	_	φυ.10		-	<del>                                     </del>	645.00			1.000	\$0.16 \$45	1.047		
GA Taxes & Fees	_				-	\$45.09	Peak Cars	33			_	\$47.19	\$660.65
GA Miscellaneous	****	****	A1 100 05:	*** ***	*****	\$15,025	Peak Cars	33	1.000	\$15,025	1.047	\$15,726	\$220,158
TOTALS	\$87.43	\$2.98	\$1,103,974	\$68,546	\$144,147	\$296,889							\$17,944,210
2012 Resource Variable Values	87,461	2,572,416	1.4	37.3	22	33	J					Rev Train-Hrs	48,300
Triangle Transit agency fringe benefit rates us												Rev Car-Miles	959,100
Vehicle Operations =												Peak Cars	14
Vehicle Maintenance												Track Miles	34.3
Non-Vehicle Maintenance =	= 33.11%											Stations	17



# **APPENDIX B** - Durham Area Transit Authority Incremental Cost (Over Existing) of Each Alternative



#### **Appendix B Table 1**

Durham-Orange County Corridor
Triangle Regional Transit Program
O&M Cost Models
DURHAM AREA TRANSIT AUTHORITY BUS LINE ITEM DETAIL

No-Build

													Inflatio	n Factor:	1.049
	2012	Existing	New		Bus Supply Va	riable Unit Co	ost Rate (\$201	2)		ductivity Ratio		Base Year		Results in:	
Function I has been	Estim. Bus	Unit Cost	Unit Cost	Revenue	Revenue		Tues eit Ctue	Baali Busas	Resource Variable	Resource Value	Resource/	Resource Unit Cost	Inflation Factor	Resource	Estimated
Expense Line Item VEHICLE OPERATIONS - PURCHASED TRANSP.	Expenses	Adjusted	Added	Bus-Hours	Bus-Miles	Garages	Transit Ctrs	Peak Buses	variable	value	Supply	Unit Cost	Factor	Unit Cost	Annual Co
		1			1		1	1				****			
OPERATORS' SALARIES & WAGES	\$4,876,800			\$25.59					Work Hours	220,480	1.157	\$22.12	1.049	\$23.21	\$990,477
FRINGE BENEFITS	\$2,960,971			\$15.54					Work Hours	220,480	1.157	\$13.43	1.049	\$14.09	\$601,373
PROFESSIONAL & TECHNICAL SERVICES	\$391,359							\$10,299	Peak Buses	38	1.000	\$10,299	1.049	\$10,805	\$75,633
FUEL & LUBRICANTS	\$1,935,584				\$0.72				Revenue Miles	2,694,208	1.000	\$0.718	1.049	\$0.754	\$348,499
TIRES & TUBES	\$215,608				\$0.08				Revenue Miles	2,694,208	1.000	\$0.080	1.049	\$0.084	\$38,820
MISCELLANEOUS EXPENSES	\$30,110					\$30,110			Garages	1	1.000	\$30,110	1.049	\$31,588	\$0
VEHICLE MAINTENANCE - PURCHASED TRANSP.															
SALARIES & WAGES	\$917,510				\$0.34				Work Hours	39,520	0.015	\$23.22	1.049	\$24.36	\$165,197
FRINGE BENEFITS	\$445,559				\$0.17				Work Hours	39,520	0.015	\$11.27	1.049	\$11.83	\$80,222
PROFESSIONAL & TECHNICAL SERVICES	\$189,673				\$0.07				Revenue Miles	2,694,208	1.000	\$0.070	1.049	\$0.074	\$34,150
FUEL & LUBRICANTS	\$69,387							\$1,826	Peak Buses	38	1.000	\$1,826	1.049	\$1,916	\$13,410
TIRES & TUBES	\$3,006							\$79.10	Peak Buses	38	1.000	\$79	1.049	\$82.98	\$581
OTHER MATERIALS & SUPPLIES	\$708,604				\$0.26				Revenue Miles	2,694,208	1.000	\$0.263	1.049	\$0.276	\$127,583
CASUALTY & LIABILITY	\$10,134				\$0.004				Revenue Miles	2,694,208	1.000	\$0.004	1.049	\$0.004	\$1,825
NON-VEHICLE MAINTENANCE - PURCHASED TRANSP.		•			•	•	•				•		,		
SALARIES & WAGES - Garage Driven (75%)	\$142,273					\$142,273			Work Hours	18,720	18,720	\$7.60	1.049	\$7.97	\$0
SALARIES & WAGES - Passenger Facility Driven (25%)	\$47,424						\$47,424		Work Hours	6,240	6,240	\$7.60	1.049	\$7.97	\$0
FRINGE BENEFITS - Garage Driven	\$59,232					\$59,232	*,.=:		Work Hours	18,720	18,720	\$3.16	1.049	\$3.32	\$0
FRINGE BENEFITS - Passenger Facility Driven	\$19,744					***,===	\$19,744		Work Hours	6,240	6,240	\$3.16	1.049	\$3.32	\$0
PROFESSIONAL & TECH SERVICES	\$58,193					\$58,193	ψ.ο,,···		Garages	1	1,000	\$58,193	1.049	\$61,051	\$0
MATERIALS & SUPPLIES	\$24,570					\$24,570			Garages	1	1.000	\$24,570	1.049	\$25,777	\$0
MISCELLANEOUS EXPENSES	\$214,694					\$214,694			Garages	1	1.000	\$214,694	1.049	\$225,239	\$0
GENERAL ADMINISTRATION - PURCHASED TRANSP.	φ <u>2</u> 14,034			l		\$214,034	<u> </u>		Garages		1.000	Ψ214,094	1.043	Ψ223,233	Ψ0
SALARIES & WAGES	\$646,945	1	l	1			1	\$17,025	Work Hours	11,900	313	\$54.37	1.049	\$57.04	\$125,028
	\$213,696							\$5,624	Work Hours	11,900	313	\$17.96	1.049	\$18.84	\$41,299
FRINGE BENEFITS						000 400		\$5,624		11,900	1,000		1.049		\$41,299
PROF & TECHNICAL SERVICES - Garage Driven	\$66,422					\$66,422		***	Garages			\$66,422		\$69,684	
PROF & TECHNICAL SERVICES - Pk Bus Driven	\$614,093					*		\$16,160	Peak Buses	38	1.000	\$16,160	1.049	\$16,954	\$118,679
MATERIALS & SUPPLIES	\$50,249					\$50,249			Garages	1	1.000	\$50,249	1.049	\$52,717	\$0
UTILITIES	\$116,761					\$116,761			Garages	1	1.000	\$116,761	1.049	\$122,496	\$0
CASUALTY & LIABILITY	\$893,113							\$23,503	Peak Buses	38	1.000	\$23,503	1.049	\$24,657	\$172,602
TAXES & FEES	\$55,863							\$1,470	Peak Buses	38	1.000	\$1,470	1.049	\$1,542	\$10,796
MISCELLANEOUS EXPENSES	\$287,295							\$7,560	Peak Buses	38	1.000	\$7,560	1.049	\$7,932	\$55,522
GENERAL ADMINISTRATION - DIRECTLY OPERATED															
SALARIES & WAGES	\$483,893							\$12,734	Work Hours	8,900	234	\$54.37	1.049	\$57.04	\$93,516
FRINGE BENEFITS	\$139,821							\$3,680	Work Hours	8,900	234	\$15.71	1.049	\$16.48	\$27,022
UTILITIES	\$17,416					\$17,416			Garages	1	1.000	\$17,416	1.049	\$18,271	\$0
TOTALS	\$16,906,003			\$41.13	\$1.64	\$779,920	\$67,168	\$99,960							\$3,122,233
2012 Resource Variable Values				190,551	2,694,208	1	1	38	1					Revenue Hours	36,889
Notes:														Revenue Miles	462,378
NTD Fringe Benefit Rate for Vehicle Ops =	60.7%													Garages	0
NTD Fringe Benefit Rate for Vehicle Maint =     NTD Fringe Benefit Rate for Non-Veh Maint =	48.6% 41.6%													Transit Centers Peak Buses	7
NTD Fringe Benefit Rate for Non-ven Maint =     NTD Fringe Benefit Rate for General Admin =	33.0%													reak buses	
5. 2012 line item costs based on 2011 ratios applied to 20		functional are	ea.												



#### **Appendix B Table 2**

Durham-Orange County Corridor
Triangle Regional Transit Program
O&M Cost Models
DURHAM AREA TRANSIT AUTHORITY BUS LINE ITEM DETAIL

В	u	11	d	

Esting	76,800 60,971 1,1,359 35,584 5,608 0,110 7,510 5,5559 9,673 3,387 0,006 8,604	Existing Unit Cost Adjusted	New Unit Cost Added	Revenue Bus-Hours \$25.59 \$15.54	Revenue Bus-Miles \$0.72 \$0.08		Transit Ctrs		Resource Variable  Work Hours  Work Hours  Peak Buses	Resource Value 220,480 220,480	Resource/ Supply  1.157  1.157	Base Year Resource Unit Cost \$22.12 \$13.43	Inflation Factor 1.049 1.049	Results in: Resource Unit Cost  \$23.21 \$14.09	2015\$ Estimated Annual Cos \$1,641,488
Exp   Exp   Exp	76,800   60,971   11,359   35,584   5,608   0,110   7,510   5,559   9,673   9,387   0,006   8,604			Bus-Hours \$25.59	Bus-Miles \$0.72	Garages	Transit Ctrs		Work Hours Work Hours	220,480 220,480	<b>Supply</b> 1.157	Unit Cost \$22.12	<b>Factor</b> 1.049	Unit Cost \$23.21	\$1,641,488
### CHAINTEN STORMS PROCHASED TRANSP.  OPERATORS' SALARIES & WAGES \$4.6: FRINGE BENEFITS \$2.9: PROFESSIONAL & TECHNICAL SERVICES \$39 FUEL & LUBRICANTS \$1.9: TIRES & TUBES \$2.7: MISCELLANEOUS EXPENSES \$30  ###################################	76,800   60,971   11,359   35,584   5,608   0,110   7,510   5,559   9,673   9,387   6,006   8,604	Adjusted	Added	\$25.59	\$0.72	Garages	Iransit Ctrs		Work Hours Work Hours	220,480 220,480	1.157	\$22.12	1.049	\$23.21	\$1,641,488
OPERATORS' SALARIES & WAGES         \$4.8:           FRINGE BENEFITS         \$2.9           PROFESSIONAL & TECHNICAL SERVICES         \$39           FUEL & LUBRICANTS         \$1,9:           TIRES & TUBES         \$2.1           MISCELLANEOUS EXPENSES         \$30           EHICLE MAINTENANCE - PURCHASED TRANSP.         \$34           FRINGE BENEFITS         \$44           PROFESSIONAL & TECHNICAL SERVICES         \$18           FUEL & LUBRICANTS         \$65           TIRES & TUBES         \$3           OTHER MATERIALS & SUPPLIES         \$70           CASUALTY & LIABILITY         \$10           ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.         \$44           SALARIES & WAGES - Garage Driven (75%)         \$14           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47           FRINGE BENEFITS - Passenger Facility Driven         \$15           FRINGE BENEFITS - Passenger Facility Driven         \$15	60,971 11,359 35,584 5,608 0,110 7,510 5,559 9,673 9,387 6,006 8,604							\$10,299	Work Hours	220,480					
FRINGE BENEFITS   \$2,98     PROFESSIONAL & TECHNICAL SERVICES   \$39     FUEL & LUBRICANTS   \$1,93     TIRES & TUBES   \$21,	60,971 11,359 35,584 5,608 0,110 7,510 5,559 9,673 9,387 6,006 8,604							\$10,299	Work Hours	220,480					
PROFESSIONAL & TECHNICAL SERVICES         \$39           FUEL & LUBRICANTS         \$1,93           TIRES & TUBES         \$21           MISCELLANEOUS EXPENSES         \$30           EHICLE MAINTENANCE - PURCHASED TRANSP.         SALARIES & WAGES           SALARIES & WAGES         \$91           FRINGE BENEFITS         \$44           PROFESSIONAL & TECHNICAL SERVICES         \$18           FUEL & LUBRICANTS         \$65           TIRES & TUBES         \$30           OTHER MATERIALS & SUPPLIES         \$70           CASUALTY & LIABILITY         \$10           ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.         SALARIES & WAGES - Garage Driven (75%)         \$14           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47           FRINGE BENEFITS - Garage Driven         \$55           FRINGE BENEFITS - Passenger Facility Driven         \$15	7,359 35,584 5,608 0,110 7,510 5,559 9,673 9,387 0,006 8,604			\$15.54				\$10,299			1.157	\$13.43	1.049	\$14.09	
### FUEL & LUBRICANTS	35,584 5,608 0,110 7,510 5,559 9,673 9,387 0,006 8,604							\$10,299	Peak Buses					1	\$996,637
TIRES & TUBES	5,608 0,110 7,510 5,559 9,673 9,387 0,006 8,604						I .			38	1.000	\$10,299	1.049	\$10,805	\$118,852
MISCELLANEOUS EXPENSES   \$30   EHICLE MAINTENANCE - PURCHASED TRANSP.     SALARIES & WAGES   \$91   FRINGE BENEFITS   \$44   PROFESSIONAL & TECHNICAL SERVICES   \$18   FUEL & LUBRICANTS   \$65   TIRES & TUBES   \$3   OTHER MATERIALS & SUPPLIES   \$70   CASUALTY & LIABILITY   \$10   ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.     SALARIES & WAGES - Garage Driven (75%)   \$14   SALARIES & WAGES - Passenger Facility Driven (25%)   \$47   FRINGE BENEFITS - Garage Driven   \$55   FRINGE BENEFITS - Passenger Facility Driven (25%)   \$17   FRINGE BENEFITS - Passenger Facility Driven   \$15	7,510 5,559 9,673 9,387 0,006 8,604				\$0.08		<u> </u>		Revenue Miles	2,694,208	1.000	\$0.718	1.049	\$0.754	\$572,181
### ##################################	7,510 5,559 9,673 9,387 9,006 8,604								Revenue Miles	2,694,208	1.000	\$0.080	1.049	\$0.084	\$63,736
SALARIES & WAGES         \$91           FRINGE BENEFITS         \$44           PROFESSIONAL & TECHNICAL SERVICES         \$18           FUEL & LUBRICANTS         \$65           TIRES & TUBES         \$3           OTHER MATERIALS & SUPPLIES         \$70           CASUALTY & LIABILITY         \$10           ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.         SALARIES & WAGES - Garage Driven (75%)         \$14           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47           FRINGE BENEFITS - Garage Driven         \$55           FRINGE BENEFITS - Passenger Facility Driven         \$15	9,673 9,387 9,006 8,604					\$30,110			Garages	1	1.000	\$30,110	1.049	\$31,588	\$0
FRINGE BENEFITS   \$44   PROFESSIONAL & TECHNICAL SERVICES   \$18   FUEL & LUBRICANTS   \$65   TIRES & TUBES   \$33   OTHER MATERIALS & SUPPLIES   \$70   CASUALTY & LIABILITY   \$10   ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.   SALARIES & WAGES - Garage Driven (75%)   \$14   SALARIES & WAGES - Passenger Facility Driven (25%)   \$47   FRINGE BENEFITS - Garage Driven   \$55   FRINGE BENEFITS - Passenger Facility Driven   \$15	9,673 9,387 9,006 8,604														
PROFESSIONAL & TECHNICAL SERVICES         \$18           FUEL & LUBRICANTS         \$65           TIRES & TUBES         \$3           OTHER MATERIALS & SUPPLIES         \$70           CASUALTY & LIABILITY         \$10           ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.         \$47           SALARIES & WAGES - Garage Driven (75%)         \$14           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47           FRINGE BENEFITS - Garage Driven         \$55           FRINGE BENEFITS - Passenger Facility Driven         \$15	9,673 9,387 ,006 18,604				\$0.34				Work Hours	39,520	0.015	\$23.22	1.049	\$24.36	\$271,227
FUEL & LUBRICANTS         \$65           TIRES & TUBES         \$3           OTHER MATERIALS & SUPPLIES         \$70           CASUALTY & LIABILITY         \$10           ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.         \$14           SALARIES & WAGES - Garage Driven (75%)         \$14           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47           FRINGE BENEFITS - Garage Driven         \$55           FRINGE BENEFITS - Passenger Facility Driven         \$15	9,387 ,006 8,604				\$0.17				Work Hours	39,520	0.015	\$11.27	1.049	\$11.83	\$131,712
TIRES & TUBES	,006 8,604				\$0.07				Revenue Miles	2,694,208	1.000	\$0.070	1.049	\$0.074	\$56,069
OTHER MATERIALS & SUPPLIES \$70 CASUALTY & LIABILITY \$10 ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.  SALARIES & WAGES - Garage Driven (75%) \$14 SALARIES & WAGES - Passenger Facility Driven (25%) \$47 FRINGE BENEFITS - Garage Driven \$55 FRINGE BENEFITS - Passenger Facility Driven \$15	8,604							\$1,826	Peak Buses	38	1.000	\$1,826	1.049	\$1,916	\$21,072
CASUALTY & LIABILITY         \$10           ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.         SALARIES & WAGES - Garage Driven (75%)         \$14           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47           FRINGE BENEFITS - Garage Driven         \$55           FRINGE BENEFITS - Passenger Facility Driven         \$15								\$79.10	Peak Buses	38	1.000	\$79	1.049	\$82.98	\$913
ION-VEHICLE MAINTENANCE - PURCHASED TRANSP.	1124				\$0.26				Revenue Miles	2,694,208	1.000	\$0.263	1.049	\$0.276	\$209,472
SALARIES & WAGES - Garage Driven (75%)         \$14.           SALARIES & WAGES - Passenger Facility Driven (25%)         \$47.           FRINGE BENEFITS - Garage Driven         \$56.           FRINGE BENEFITS - Passenger Facility Driven         \$15.	1,134				\$0.004				Revenue Miles	2,694,208	1.000	\$0.004	1.049	\$0.004	\$2,996
SALARIES & WAGES - Passenger Facility Driven (25%) \$47 FRINGE BENEFITS - Garage Driven \$56 FRINGE BENEFITS - Passenger Facility Driven \$15															
FRINGE BENEFITS - Garage Driven \$59 FRINGE BENEFITS - Passenger Facility Driven \$19	2,273					\$142,273			Work Hours	18,720	18,720	\$7.60	1.049	\$7.97	\$0
FRINGE BENEFITS - Passenger Facility Driven \$19	7,424						\$47,424		Work Hours	6,240	6,240	\$7.60	1.049	\$7.97	\$0
š /	9,232					\$59,232			Work Hours	18,720	18,720	\$3.16	1.049	\$3.32	\$0
	9,744						\$19,744		Work Hours	6,240	6,240	\$3.16	1.049	\$3.32	\$0
PROFESSIONAL & TECH SERVICES \$58	3,193					\$58,193			Garages	1	1.000	\$58,193	1.049	\$61,051	\$0
	4,570					\$24,570			Garages	1	1.000	\$24,570	1.049	\$25,777	\$0
	4,694					\$214,694			Garages	1	1.000	\$214,694	1.049	\$225,239	\$0
SENERAL ADMINISTRATION - PURCHASED TRANSP.	,														
	6,945				I	I		\$17,025	Work Hours	11,900	313	\$54.37	1.049	\$57.04	\$196,472
	3.696							\$5,624	Work Hours	11,900	313	\$17.96	1.049	\$18.84	\$64.898
	5,422					\$66,422		ψ0,02 :	Garages	1	1.000	\$66,422	1.049	\$69,684	\$0
ů .	4.093					ψ00, IZZ		\$16,160	Peak Buses	38	1.000	\$16,160	1.049	\$16,954	\$186,495
	0,249					\$50,249	1	<b>\$10,100</b>	Garages	1	1.000	\$50,249	1.049	\$52,717	\$0
	6,761					\$116,761	1		Garages	1	1.000	\$116,761	1.049	\$122,496	\$0
	3,113					\$110,701	<u> </u>	\$23,503	Peak Buses	38	1.000	\$23,503	1.049	\$24,657	\$271,231
	5.863							\$1,470	Peak Buses	38	1.000	\$1,470	1.049	\$1,542	\$16,965
	7,295						<del>                                     </del>	\$7,560	Peak Buses	38	1.000	\$7,560	1.049	\$7,932	\$87,249
GENERAL ADMINISTRATION - DIRECTLY OPERATED	1,230			l	I			φ1,500	i car buses	30	1.000	ψ1,500	1.043	ψ1,332	ψ01,249
	3,893							\$12,734	Work Hours	8,900	234	\$54.37	1.049	\$57.04	\$146,954
	9,821				<b> </b>		1	\$12,734 \$3.680	Work Hours Work Hours	8,900	234	\$54.37 \$15.71	1.049	\$57.04 \$16.48	\$146,954
	7,416				<u> </u>	¢17.41C	<del>                                     </del>	φο,υου		8,900	1.000	\$17,416	1.049	\$16.48	\$42,462
	_			641.12	\$1.64	\$17,416 <b>\$779,920</b>	\$67,168	\$99,960	Garages	'	1.000	\$17,410	1.049	\$10,271	\$5,099,08
	006,003			\$41.13										Daniel III	
012 Resource Variable Values				190,551	2,694,208	1	1	38	i					Revenue Hours Revenue Miles	61,135 759,152
	0.7%													Garages	759,152
	3.6%													Transit Centers	0
	1.6%														
. NTD Fringe Benefit Rate for General Admin = 33 . 2012 line item costs based on 2011 ratios applied to 2012 NTD	3.0%													Peak Buses	11



# APPENDIX C – Chapel Hill Transit Incremental Cost (Over Existing) of Each Alternative



#### **Appendix C Table 1**

Durham-Orange County Corridor
Triangle Regional Transit Program
O&M Cost Models
CHAPEL HILL TRANSIT BUS LINE ITEM DETAIL

O&IVI Cost IVIodels													No-Build	
CHAPEL HILL TRANSIT BUS LINE ITE	EM DETAI	L												
												Inflati	on Factor:	1.049
	2012 Bus	Existing Unit Cost	New Unit Cost		pply Variable Revenue	Unit Cost Ra	te (\$2012)	Prod Resource	Resource	Resource/	Base Year Resource	Inflation	Results in: Resource	2015\$ Estimate
Expense Line Item	Expenses	Adjusted	Added	Bus-Hours	Bus-Miles	Garages	Peak Buses	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Co
VEHICLE OPERATIONS		,												
OPERATORS' SALARIES & WAGES	\$4,196,294			\$26.60				Work Hours	273,394	1.73	\$15.35	1.049	\$16.10	\$773,814
OTHER SALARIES & WAGES - Rev-Hours Driven (70%)	\$238,768			\$1.51				Work Hours	9,569	0.06	\$24.95	1.049	\$26.18	\$44,030
OTHER SALARIES & WAGES - Oper Garage Driven (30%)	\$102.329					\$102.329		Work Hours	4.101	4.101	\$24.95	1.049	\$26.18	\$0
FRINGE BENEFITS - Rev-Hours Driven	\$3,039,852			\$19.27		<b>*</b> · · · · · · · · · · · · · · · · · · ·		Work Hours	282,963	1.79	\$10.74	1.049	\$11.27	\$560,561
FRINGE BENEFITS - Oper Garage Driven	\$70,138					\$70,138		Work Hours	4,101	4,101	\$17.10	1.049	\$17.94	\$0
FUEL & LUBRICANTS	\$1,696,001				\$0.94	, ,, ,,		Gallons	499,763	0.28	\$3.39	1.049	\$3.56	\$355,023
TIRES & TUBES	\$14,356				\$0.01			Revenue Miles	1,799,539	1.00	\$0.01	1.049	\$0.01	\$3,005
OTHER MATERIALS & SUPPLIES	\$68,572					\$68,572		Garages	1	1.00	\$68,572	1.049	\$71,940	\$0
MISCELLANEOUS EXPENSES	\$52,080					\$52,080		Garages	1	1.00	\$52,080	1.049	\$54.638	\$0
VEHICLE MAINTENANCE	\$02,000			I		ψ0 <u>2</u> ,000		Caragoo		1.00	ψ0 <u>2</u> ,000	1.0.0	ψο 1,000	Ψ.
SALARIES & WAGES	\$951,167				\$0.53		1	Work Hours	54,118	0.03	\$17.58	1.049	\$18.44	\$199,108
FRINGE BENEFITS	\$570,020				\$0.32			Work Hours	54,118	0.03	\$10.53	1.049	\$11.05	\$119,322
FUEL & LUBRICANTS	\$45,831				*****		\$627.82	Peak Buses	73	1.00	\$628	1.049	\$659	\$4,611
TIRES & TUBES	\$0						\$0.00	Peak Buses	73	1.00	\$0.00	1.049	\$0.00	\$0
OTHER MATERIALS & SUPPLIES	\$745,440				\$0.41		40.00	Revenue Miles	1,799,539	1.00	\$0.41	1.049	\$0.43	\$156,043
MISCELLANEOUS EXPENSES	\$15,343				*	\$15,343		Garages	1	1.00	\$15,343	1.049	\$16,097	\$0
NON-VEHICLE MAINTENANCE	7.0,0.0					<b>4</b> · • · • · •					<b>4</b> · • , • · •		<b>4</b> . 5,55	
SALARIES & WAGES	\$59,134					\$59,134		Work Hours	3,310	3,310	\$17.87	1.049	\$18.74	\$0
FRINGE BENEFITS	\$46,405					\$46,405		Work Hours	3,310	3,310	\$14.02	1.049	\$14.71	\$0
PROF & TECH SERVICES	\$591,975					\$591,975		Garages	1	1.00	\$591,975	1.049	\$621,051	\$0
MATERIALS & SUPPLIES	\$13,417					\$13,417		Garages	1	1.00	\$13,417	1.049	\$14,076	\$0
MISCELLANEOUS EXPENSES	\$7,350					\$7,350		Garages	1	1.00	\$7,350	1.049	\$7,711	\$0
GENERAL ADMINISTRATION	•		•				•							
SALARIES & WAGES	\$439,892						\$6,026	Work Hours	20,970	287.26	\$20.98	1.049	\$22.01	\$44,253
FRINGE BENEFITS	\$198,083						\$2,713	Work Hours	20,970	287.26	\$9.45	1.049	\$9.91	\$19,927
PROFESSIONAL & TECHNICAL SERVICES	\$819,817						\$11,230	Peak Buses	73	1.00	\$11,230	1.049	\$11,782	\$82,474
MATERIALS & SUPPLIES	\$15,991					\$15,991		Garages	1	1.00	\$15,991	1.049	\$16,776	\$0
UTILITIES	\$203,545					\$203,545		Garages	1	1.00	\$203,545	1.049	\$213,543	\$0
CASUALTY & LIABILITY	\$291,700				\$0.16			Revenue Miles	1,799,539	1.00	\$0.16	1.049	\$0.17	\$61,061
MISCELLANEOUS EXPENSES	\$56,119						\$769	Peak Buses	73	1.00	\$769	1.049	\$807	\$5,646
TOTALS	\$14,549,619			\$47.38	\$2.37	\$1,246,279	\$21,366							\$2,428,878
2012 Resource Variable Values				157,768	1,799,539	1	73						Revenue Hours	27,731
Notes:								-					Revenue Miles	359,061
NTD Fringe Benefit Rate for Vehicle Ops =     NTD Fringe Benefit Bate for Vehicle Maint	68.5%												Garages	0
NTD Fringe Benefit Rate for Vehicle Maint =     NTD Fringe Benefit Rate for Non-Vehicle Maint =	59.9% 78.5%												Transit Centers Peak Buses	7
NTD Fringe Benefit Rate for Ron-Verlice Maint =     NTD Fringe Benefit Rate for General Admin =	45.0%												redk Duses	



#### **Appendix C Table 2**

Durham-Orange County Corridor
Triangle Regional Transit Program
O&M Cost Models
CHAPEL HILL TRANSIT BUS LINE ITEM DETAIL

Build

												Inflati	on Factor:	1.049
	2012	Existing	New	Bus St	ıpply Variable	Unit Cost Ra	te (\$2012)	Prod	uctivity Ratio		Base Year		Results in:	2015\$
	Bus	Unit Cost	Unit Cost	Revenue	Revenue			Resource	Resource	Resource/	Resource	Inflation	Resource	Estimated
Expense Line Item	Expenses	Adjusted	Added	<b>Bus-Hours</b>	Bus-Miles	Garages	Peak Buses	Variable	Value	Supply	Unit Cost	Factor	Unit Cost	Annual Cost
VEHICLE OPERATIONS	Ι.					1		Γ						
OPERATORS' SALARIES & WAGES	\$4,196,294			\$26.60				Work Hours	273,394	1.73	\$15.35	1.049	\$16.10	\$620,396
OTHER SALARIES & WAGES - Rev-Hours Driven (70%)	\$238,768			\$1.51				Work Hours	9,569	0.06	\$24.95	1.049	\$26.18	\$35,300
OTHER SALARIES & WAGES - Oper Garage Driven (30%)	\$102,329					\$102,329		Work Hours	4,101	4,101	\$24.95	1.049	\$26.18	\$0
FRINGE BENEFITS - Rev-Hours Driven	\$3,039,852			\$19.27				Work Hours	282,963	1.79	\$10.74	1.049	\$11.27	\$449,423
FRINGE BENEFITS - Oper Garage Driven	\$70,138					\$70,138		Work Hours	4,101	4,101	\$17.10	1.049	\$17.94	\$0
FUEL & LUBRICANTS	\$1,696,001				\$0.94			Gallons	499,763	0.28	\$3.39	1.049	\$3.56	\$256,062
TIRES & TUBES	\$14,356				\$0.01			Revenue Miles	1,799,539	1.00	\$0.01	1.049	\$0.01	\$2,167
OTHER MATERIALS & SUPPLIES	\$68,572					\$68,572		Garages	1	1.00	\$68,572	1.049	\$71,940	\$0
MISCELLANEOUS EXPENSES	\$52,080					\$52,080		Garages	1	1.00	\$52,080	1.049	\$54,638	\$0
VEHICLE MAINTENANCE														
SALARIES & WAGES	\$951,167				\$0.53			Work Hours	54,118	0.03	\$17.58	1.049	\$18.44	\$143,607
FRINGE BENEFITS	\$570,020				\$0.32			Work Hours	54,118	0.03	\$10.53	1.049	\$11.05	\$86,062
FUEL & LUBRICANTS	\$45,831						\$627.82	Peak Buses	73	1.00	\$628	1.049	\$659	(\$659)
TIRES & TUBES	\$0						\$0.00	Peak Buses	73	1.00	\$0.00	1.049	\$0.00	\$0
OTHER MATERIALS & SUPPLIES	\$745,440				\$0.41			Revenue Miles	1,799,539	1.00	\$0.41	1.049	\$0.43	\$112,546
MISCELLANEOUS EXPENSES	\$15,343					\$15,343		Garages	1	1.00	\$15,343	1.049	\$16,097	\$0
NON-VEHICLE MAINTENANCE														
SALARIES & WAGES	\$59,134					\$59,134		Work Hours	3,310	3,310	\$17.87	1.049	\$18.74	\$0
FRINGE BENEFITS	\$46,405					\$46,405		Work Hours	3,310	3,310	\$14.02	1.049	\$14.71	\$0
PROF & TECH SERVICES	\$591,975					\$591,975		Garages	1	1.00	\$591,975	1.049	\$621,051	\$0
MATERIALS & SUPPLIES	\$13,417					\$13,417		Garages	1	1.00	\$13,417	1.049	\$14,076	\$0
MISCELLANEOUS EXPENSES	\$7,350					\$7,350		Garages	1	1.00	\$7,350	1.049	\$7,711	\$0
GENERAL ADMINISTRATION							•		•					
SALARIES & WAGES	\$439,892						\$6,026	Work Hours	20,970	287.26	\$20.98	1.049	\$22.01	(\$6,322)
FRINGE BENEFITS	\$198,083						\$2,713	Work Hours	20,970	287.26	\$9.45	1.049	\$9.91	(\$2,847)
PROFESSIONAL & TECHNICAL SERVICES	\$819,817						\$11,230	Peak Buses	73	1.00	\$11,230	1.049	\$11,782	(\$11,782)
MATERIALS & SUPPLIES	\$15,991					\$15.991		Garages	1	1.00	\$15,991	1.049	\$16,776	\$0
UTILITIES	\$203,545					\$203,545		Garages	1	1.00	\$203,545	1.049	\$213,543	\$0
CASUALTY & LIABILITY	\$291,700				\$0.16			Revenue Miles	1,799,539	1.00	\$0.16	1.049	\$0.17	\$44,041
MISCELLANEOUS EXPENSES	\$56,119				*		\$769	Peak Buses	73	1.00	\$769	1.049	\$807	(\$807)
TOTALS	\$14,549,619			\$47.38	\$2.37	\$1,246,279	\$21,366						, , ,	\$1,727,189
2012 Resource Variable Values	, , , , , , ,			157,768	1,799,539	1	73						Revenue Hours	22,233
Notes:	•		1	,	, ,			ı					Revenue Miles	258,974
NTD Fringe Benefit Rate for Vehicle Ops =	68.5%												Garages	0
NTD Fringe Benefit Rate for Vehicle Maint =	59.9%												Transit Centers	0
3. NTD Fringe Benefit Rate for Non-Vehicle Maint =	78.5%												Peak Buses	(1)
NTD Fringe Benefit Rate for General Admin =	45.0%													